

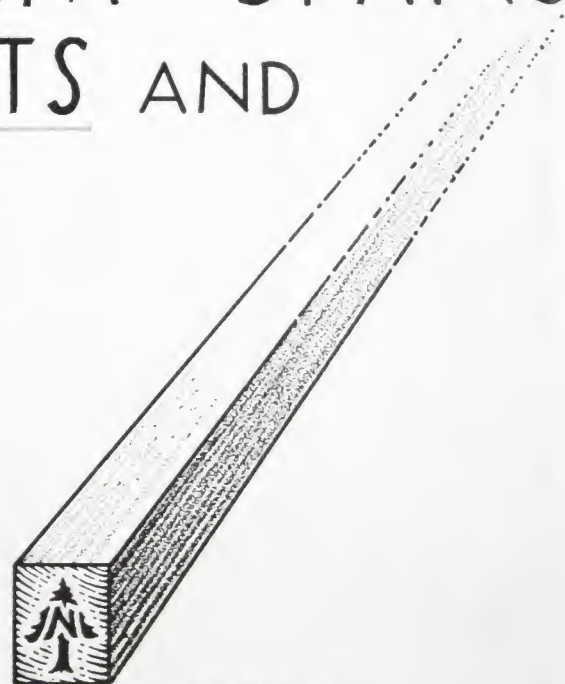
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LUMBER
AND ITS
UTILIZATION



MAXIMUM SPANS FOR JOISTS AND RAFTERS



NATIONAL LUMBER
MANUFACTURERS
ASSOCIATION

VOL. IV · CH. 4

CONSTRUCTION INFORMATION SERIES

FOREWORD

The tables in this chapter provide a means for readily ascertaining the maximum safe spans for joists and rafters under the uniform live loads ordinarily encountered in buildings and for the usual working stress, joist size, and spacing combinations. All span lengths given in the tables are for dressed lumber sizes as given on page 27 in the table of properties of American Standard Sizes for dimension lumber and timber.

To determine the maximum safe span for a joist, first ascertain the allowable working stress for the species and grade of lumber used by referring to the local building code or to Chapter VII of this series, Working Stresses for Structural Timber. Then in the table for the live load to be supported and reading across from the size of joist and spacing on centers used, the maximum allowable span will be found under the column headed by the allowable working stress.

Spans are given for two controlling conditions, one being so limited that deflection under the calculated load will not exceed $1/360$ of the span length and the other determined by the bending strength of the piece. The deflection should be limited to prevent cracks where ceilings are covered with some hard, inelastic material such as plaster. Where ceilings are not so covered and a small amount of deflection is not objectionable, the span length may be determined by the bending strength or by the allowable horizontal shear stress (which-ever governs) instead of by the stiffness of the member.

When the tables are used to determine the span lengths under heavier loads, the reader is cautioned to note that spans given for bending and deflection must be checked against those limited by horizontal shear for the particular load involved. Thus for a live load of 100 lbs. per sq. ft., it is essential to find both the span length limited by the horizontal shear stress and by the allowable stress in extreme fibre and use the shortest of the two. This is necessary as a joist might be of adequate size to support the load so far as its bending strength is concerned, but might fail because it had a greater span than justified by the allowable horizontal shear stress permitted, or, conversely, if the span was selected based on the allowable shear it might be greater than that permitted for bending. The ratio of extreme fibre stress to horizontal shear is not constant for all species, some having a relatively high extreme fibre stress in bending with a comparatively low horizontal shear stress, while for others the ratio is much different. Also, when designing for stiffness, that is to limit the deflection of the joist, it is necessary to check the deflection, bending, and shear spans and use the shortest of the three.

On page 27 appears a table of properties of American Standard Sizes of dimension lumber and timber. This data is supplementary to the table and is provided for use in conjunction with the usual formulas employed in designing structural members of wood.

The information in this chapter being adapted to American Standard Sizes of dressed lumber will, it is hoped, be of timely, practical service and convenience to building officials, architects, engineers, contractors and builders and those using lumber in building.

There is obtainable from the National Lumber Manufacturers Association information relating to working stresses, grades, and qualities of structural material which is useful both as general information and in conjunction with building codes. The data appearing in this chapter prepared under the direction of Richard G. Kimbell are issued under the authority and responsibility of the National Lumber Manufacturers Association.

FLOOR JOIST SPANS (30 Pound Load)

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED																
Live Load 30 Pounds per Square Foot with Plastered Ceiling. Live Load 40 Pounds per Square Foot with Unplastered Ceiling.																
MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)																
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Limited by Deflection of 1/360 of the Span				Determined by Bending										
		Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.				Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.										
		E=1,000,000	E=1,200,000	E=1,400,000	E=1,600,000	f=900	f=1,000	f=1,100	f=1,200	f=1,300	f=1,400	f=1,500	f=1,600	f=1,700	f=1,800	Ft. Ins.
2 x 6	12	9—1	9—9	10—2	10—8	10—4	10—11	11—6	12—0	12—6	13—0	13—5	13—10	14—3	14—8	Ft. Ins.
	16	8—4	8—11	9—3	9—9	9—1	9—6	10—0	10—6	10—10	11—3	11—8	12—1	12—5	12—10	Ft. Ins.
	24	7—3	7—9	8—2	8—6	7—5	7—10	8—3	8—7	9—0	9—4	9—7	10—0	10—2	10—6	Ft. Ins.
2 x 8	12	12—0	12—10	13—6	14—0	13—9	14—6	15—3	15—11	16—6	17—2	17—9	18—4	18—10	19—5	Ft. Ins.
	16	11—0	11—9	12—4	12—11	12—0	12—8	13—4	13—11	14—5	15—0	15—6	16—0	16—6	17—0	Ft. Ins.
	24	9—8	10—3	10—10	11—4	9—11	10—5	10—11	11—5	11—11	12—4	12—9	13—3	13—7	14—0	Ft. Ins.
2 x 10	12	15—2	16—1	17—0	17—9	17—3	18—3	19—1	19—11	20—8	21—6	22—3	23—0	23—8	24—4	Ft. Ins.
	16	13—11	14—10	15—6	16—3	15—1	15—11	16—8	17—4	18—2	18—10	19—6	20—1	20—9	21—4	Ft. Ins.
	24	12—2	13—0	13—8	14—4	12—6	13—3	13—10	14—5	15—0	15—7	16—1	16—7	17—1	17—8	Ft. Ins.
2 x 12	12	18—3	19—5	20—5	21—4	20—8	21—10	22—11	23—11	24—10	25—9	26—8	27—7	28—5	29—3	Ft. Ins.
	16	16—9	17—10	18—8	19—6	18—1	19—3	20—1	20—11	21—10	22—8	23—5	24—3	24—11	25—8	Ft. Ins.
	24	14—9	15—8	16—6	17—3	15—0	15—10	16—7	17—5	18—1	18—9	19—5	20—0	20—8	21—3	Ft. Ins.
2 x 14	12	21—3	22—7	23—9	24—9	24—0	25—3	26—6	27—8	28—9	29—10	30—0	31—1	32—1	33—1	Ft. Ins.
	16	19—6	20—9	21—9	22—9	21—0	22—3	23—4	24—4	25—3	26—4	27—3	28—1	29—0	29—10	Ft. Ins.
	24	17—3	18—4	19—4	20—2	17—6	18—6	19—4	20—3	21—0	21—10	22—7	23—4	24—1	24—9	Ft. Ins.
3 x 6	12	10—6	11—2	11—10	12—4	13—0	13—8	14—4	15—0	15—7	16—2	16—9	17—4	17—10	18—4	Ft. Ins.
	16	9—7	10—2	10—10	11—4	11—4	12—0	12—6	13—1	13—8	14—2	14—8	15—2	15—8	16—1	Ft. Ins.
	24	8—6	9—0	9—6	10—0	9—4	9—11	10—4	10—10	11—3	11—7	12—1	12—6	12—11	13—3	Ft. Ins.
3 x 8	12	13—11	14—10	15—7	16—4	17—1	17—11	18—10	19—8	20—6	21—3	22—0	22—9	23—5	24—2	Ft. Ins.
	16	12—10	13—8	14—4	14—11	15—0	15—9	16—7	17—4	18—0	18—8	19—4	20—0	20—7	21—2	Ft. Ins.
	24	11—3	12—0	12—8	13—2	12—5	13—1	13—9	14—4	14—11	15—6	16—0	16—7	17—1	17—6	Ft. Ins.
3 x 10	12	17—6	18—7	19—6	20—5	21—3	22—5	23—6	24—7	25—7	26—7	27—6	28—5	29—3	30—0	Ft. Ins.
	16	16—0	17—0	17—11	18—9	18—9	19—9	20—9	21—8	22—7	23—5	24—3	25—0	25—9	26—6	Ft. Ins.
	24	13—2	15—1	15—11	16—8	15—7	16—5	17—3	18—0	18—9	19—5	20—2	20—10	21—5	22—1	Ft. Ins.
3 x 12	12	20—11	22—3	23—5	24—5	25—5	26—9	28—1	29—4	30—0	31—0	32—0	33—0	34—0	35—0	Ft. Ins.
	16	19—4	20—6	21—7	22—7	22—5	23—8	24—10	25—11	27—0	28—0	29—0	30—0	31—0	32—0	Ft. Ins.
	24	17—1	18—2	19—2	19—11	18—9	19—9	20—9	21—8	22—6	23—4	24—2	25—0	25—9	26—6	Ft. Ins.
3 x 14	12	23—4	25—11	27—3	28—6	29—5	30—0	31—0	32—0	33—0	34—0	35—0	36—0	37—0	38—0	Ft. Ins.
	16	22—6	23—10	25—2	26—4	26—1	27—6	28—10	29—11	31—0	32—4	33—8	35—0	36—4	37—8	Ft. Ins.
	24	20—0	21—3	22—4	23—4	21—8	23—0	24—3	25—2	26—3	27—3	28—2	29—1	30—0	31—0	Ft. Ins.

NOTE.—The lengths are based on: When limited by deflection—Maximum allowable deflection of 1/360 of span length. Modulus of elasticity as noted for “E.” When determined by bending strength of the piece—Allowable stress in extreme fibre in bending as noted for “f.”

Dead load—Weight of joist. Weight of lath and plaster ceiling (10 pounds per square foot). Double thickness of flooring (5 pounds per square foot). Live load—30 pounds per square foot of floor area with ceiling plastered, or 40 pounds per square foot with ceiling unplastered.

NOTE.—The lengths are based on:

When limited by deflection—

Maximum allowable deflection of 1/360 of span length.

Modulus of elasticity as noted for "E."

When determined by bending strength of the piece—

Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of joist.

Weight of lath and plaster ceiling (10 pounds per square foot).

Double thickness of flooring (5 pounds per square foot).

Live load—30 pounds per square foot of floor area with ceiling plastered, or

40 pounds per square foot with ceiling unplastered.

FLOOR JOIST SPANS (40 Pound Load)

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED

Live Load 40 Pounds per Square Foot with Plastered Ceiling. Live Load 50 Pounds per Square Foot with Unplastered Ceiling.

MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)

Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Determined by Bending									
		Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.									
		f=900	f=1,000	f=1,100	f=1,200	f=1,300	f=1,400	f=1,500	f=1,600	f=1,700	f=1,800
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Limited by Deflection of 1/360 of the Span									
		Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.									
		E=1,000,000	E=1,200,000	E=1,400,000	E=1,600,000	E=1,800,000	E=2,000,000	E=2,200,000	E=2,400,000	E=2,600,000	E=2,800,000
2 x 6	12	Ft. Ins. 8-6 9-1 10-0	Ft. Ins. 9-1 10-0 10-5	Ft. Ins. 9-6 10-1 10-6	Ft. Ins. 10-1 10-6 11-1	Ft. Ins. 10-6 11-1 11-6	Ft. Ins. 11-1 11-6 12-1	Ft. Ins. 11-6 12-1 12-6	Ft. Ins. 12-1 12-6 13-1	Ft. Ins. 12-6 13-1 13-6	Ft. Ins. 13-1 13-6 14-1
2 x 6	16	Ft. Ins. 7-9 8-3 8-8	Ft. Ins. 8-3 8-8 9-1	Ft. Ins. 8-8 9-1 9-6	Ft. Ins. 9-1 9-6 10-0	Ft. Ins. 9-6 10-0 10-5	Ft. Ins. 10-0 10-5 10-10	Ft. Ins. 10-5 11-0 11-5	Ft. Ins. 11-0 11-5 12-0	Ft. Ins. 11-5 12-0 12-5	Ft. Ins. 12-0 12-5 13-0
2 x 6	24	Ft. Ins. 6-10 7-2 8-4	Ft. Ins. 7-2 8-4 9-6	Ft. Ins. 7-7 8-9 10-1	Ft. Ins. 8-0 9-2 10-4	Ft. Ins. 8-5 9-7 10-9	Ft. Ins. 9-0 10-2 11-4	Ft. Ins. 9-5 10-7 11-9	Ft. Ins. 10-0 11-2 12-4	Ft. Ins. 10-5 11-7 12-9	Ft. Ins. 11-0 12-2 13-4
2 x 8	12	Ft. Ins. 11-5 12-0 12-5	Ft. Ins. 12-0 12-5 13-0	Ft. Ins. 12-5 13-0 13-5	Ft. Ins. 13-0 13-5 14-0	Ft. Ins. 13-5 14-0 14-5	Ft. Ins. 14-0 14-5 15-0	Ft. Ins. 14-5 15-0 15-5	Ft. Ins. 15-0 15-5 16-0	Ft. Ins. 15-5 16-0 16-5	Ft. Ins. 16-0 16-5 17-0
2 x 8	16	Ft. Ins. 10-5 11-0 11-5	Ft. Ins. 11-0 11-5 12-0	Ft. Ins. 11-5 12-0 12-5	Ft. Ins. 12-0 12-5 13-0	Ft. Ins. 12-5 13-0 13-5	Ft. Ins. 13-0 13-5 14-0	Ft. Ins. 13-5 14-0 14-5	Ft. Ins. 14-0 14-5 15-0	Ft. Ins. 14-5 15-0 15-5	Ft. Ins. 15-0 15-5 16-0
2 x 8	24	Ft. Ins. 9-2 9-7 10-2	Ft. Ins. 9-7 10-2 10-7	Ft. Ins. 10-2 10-7 11-2	Ft. Ins. 10-7 11-2 11-7	Ft. Ins. 11-2 11-7 12-2	Ft. Ins. 11-7 12-2 12-7	Ft. Ins. 12-2 12-7 13-2	Ft. Ins. 12-7 13-2 13-7	Ft. Ins. 13-2 13-7 14-2	Ft. Ins. 13-7 14-2 14-7
2 x 10	12	Ft. Ins. 14-4 14-9 15-4	Ft. Ins. 14-9 15-4 15-9	Ft. Ins. 15-4 15-9 16-4	Ft. Ins. 15-9 16-4 16-9	Ft. Ins. 16-4 16-9 17-4	Ft. Ins. 16-9 17-4 17-9	Ft. Ins. 17-4 17-9 18-4	Ft. Ins. 17-9 18-4 18-9	Ft. Ins. 18-4 18-9 19-4	Ft. Ins. 18-9 19-4 19-9
2 x 10	16	Ft. Ins. 13-1 13-6 14-1	Ft. Ins. 13-6 14-1 14-6	Ft. Ins. 14-1 14-6 15-1	Ft. Ins. 14-6 15-1 15-6	Ft. Ins. 15-1 15-6 16-1	Ft. Ins. 15-6 16-1 16-6	Ft. Ins. 16-1 16-6 17-1	Ft. Ins. 16-6 17-1 17-6	Ft. Ins. 17-1 17-6 18-1	Ft. Ins. 17-6 18-1 18-6
2 x 10	24	Ft. Ins. 11-6 12-1 12-6	Ft. Ins. 12-1 12-6 13-1	Ft. Ins. 12-6 13-1 13-6	Ft. Ins. 13-1 13-6 14-1	Ft. Ins. 13-6 14-1 14-6	Ft. Ins. 14-1 14-6 15-1	Ft. Ins. 14-6 15-1 15-6	Ft. Ins. 15-1 15-6 16-1	Ft. Ins. 15-6 16-1 16-6	Ft. Ins. 16-1 16-6 17-1
2 x 12	12	Ft. Ins. 17-3 17-8 18-3	Ft. Ins. 17-8 18-3 18-8	Ft. Ins. 18-3 18-8 19-3	Ft. Ins. 18-8 19-3 19-8	Ft. Ins. 19-3 19-8 20-3	Ft. Ins. 19-8 20-3 20-8	Ft. Ins. 20-3 20-8 21-3	Ft. Ins. 20-8 21-3 21-8	Ft. Ins. 21-3 21-8 22-3	Ft. Ins. 21-8 22-3 22-8
2 x 12	16	Ft. Ins. 15-9 16-4 16-9	Ft. Ins. 16-4 16-9 17-4	Ft. Ins. 16-9 17-4 17-9	Ft. Ins. 17-4 17-9 18-4	Ft. Ins. 17-9 18-4 18-9	Ft. Ins. 18-4 18-9 19-4	Ft. Ins. 18-9 19-4 19-9	Ft. Ins. 19-4 19-9 20-4	Ft. Ins. 19-9 20-4 20-9	Ft. Ins. 20-4 20-9 21-4
2 x 12	24	Ft. Ins. 13-10 13-15 14-0	Ft. Ins. 13-15 14-0 14-5	Ft. Ins. 14-0 14-5 15-0	Ft. Ins. 14-5 15-0 15-5	Ft. Ins. 15-0 15-5 16-0	Ft. Ins. 15-5 16-0 16-5	Ft. Ins. 16-0 16-5 17-0	Ft. Ins. 16-5 17-0 17-5	Ft. Ins. 17-0 17-5 18-0	Ft. Ins. 17-5 18-0 18-5
2 x 14	12	Ft. Ins. 20-0 20-5 21-0	Ft. Ins. 20-5 21-0 21-5	Ft. Ins. 21-0 21-5 22-0	Ft. Ins. 21-5 22-0 22-5	Ft. Ins. 22-0 22-5 23-0	Ft. Ins. 22-5 23-0 23-5	Ft. Ins. 23-0 23-5 24-0	Ft. Ins. 23-5 24-0 24-5	Ft. Ins. 24-0 24-5 25-0	Ft. Ins. 24-5 25-0 25-5
2 x 14	16	Ft. Ins. 18-4 18-9 19-4	Ft. Ins. 18-9 19-4 19-9	Ft. Ins. 19-4 19-9 20-4	Ft. Ins. 19-9 20-4 20-9	Ft. Ins. 20-4 20-9 21-4	Ft. Ins. 20-9 21-4 21-9	Ft. Ins. 21-4 21-9 22-4	Ft. Ins. 21-9 22-4 22-9	Ft. Ins. 22-4 22-9 23-4	Ft. Ins. 22-9 23-4 23-9
2 x 14	24	Ft. Ins. 16-3 16-8 17-3	Ft. Ins. 16-8 17-3 17-8	Ft. Ins. 17-3 17-8 18-3	Ft. Ins. 17-8 18-3 18-8	Ft. Ins. 18-3 18-8 19-3	Ft. Ins. 18-8 19-3 19-8	Ft. Ins. 19-3 19-8 20-3	Ft. Ins. 19-8 20-3 20-8	Ft. Ins. 20-3 20-8 21-3	Ft. Ins. 20-8 21-3 21-8
3 x 6	12	Ft. Ins. 9-11 9-16 10-1	Ft. Ins. 9-16 10-1 10-6	Ft. Ins. 10-1 10-6 11-1	Ft. Ins. 10-6 11-1 11-6	Ft. Ins. 11-1 11-6 12-1	Ft. Ins. 11-6 12-1 12-6	Ft. Ins. 12-1 12-6 13-1	Ft. Ins. 12-6 13-1 13-6	Ft. Ins. 13-1 13-6 14-1	Ft. Ins. 13-6 14-1 14-6
3 x 6	16	Ft. Ins. 9-1 9-6 10-1	Ft. Ins. 9-6 10-1 10-6	Ft. Ins. 10-1 10-6 11-1	Ft. Ins. 10-6 11-1 11-6	Ft. Ins. 11-1 11-6 12-1	Ft. Ins. 11-6 12-1 12-6	Ft. Ins. 12-1 12-6 13-1	Ft. Ins. 12-6 13-1 13-6	Ft. Ins. 13-1 13-6 14-1	Ft. Ins. 13-6 14-1 14-6
3 x 6	24	Ft. Ins. 7-11 7-16 8-1	Ft. Ins. 7-16 8-1 8-6	Ft. Ins. 8-1 8-6 9-1	Ft. Ins. 8-6 9-1 9-6	Ft. Ins. 9-1 9-6 10-1	Ft. Ins. 9-6 10-1 10-6	Ft. Ins. 10-1 10-6 11-1	Ft. Ins. 10-6 11-1 11-6	Ft. Ins. 11-1 11-6 12-1	Ft. Ins. 11-6 12-1 12-6
3 x 8	12	Ft. Ins. 13-1 13-6 14-1	Ft. Ins. 13-6 14-1 14-6	Ft. Ins. 14-1 14-6 15-1	Ft. Ins. 14-6 15-1 15-6	Ft. Ins. 15-1 15-6 16-1	Ft. Ins. 15-6 16-1 16-6	Ft. Ins. 16-1 16-6 17-1	Ft. Ins. 16-6 17-1 17-6	Ft. Ins. 17-1 17-6 18-1	Ft. Ins. 17-6 18-1 18-6
3 x 8	16	Ft. Ins. 12-0 12-5 13-0	Ft. Ins. 12-5 13-0 13-5	Ft. Ins. 13-0 13-5 14-0	Ft. Ins. 13-5 14-0 14-5	Ft. Ins. 14-0 14-5 15-0	Ft. Ins. 14-5 15-0 15-5	Ft. Ins. 15-0 15-5 16-0	Ft. Ins. 15-5 16-0 16-5	Ft. Ins. 16-0 16-5 17-0	Ft. Ins. 16-5 17-0 17-5
3 x 8	24	Ft. Ins. 10-8 10-13 11-1	Ft. Ins. 10-13 11-1 11-6	Ft. Ins. 11-1 11-6 12-1	Ft. Ins. 11-6 12-1 12-6	Ft. Ins. 12-1 12-6 13-1	Ft. Ins. 12-6 13-1 13-6	Ft. Ins. 13-1 13-6 14-1	Ft. Ins. 13-6 14-1 14-6	Ft. Ins. 14-1 14-6 15-1	Ft. Ins. 14-6 15-1 15-6
3 x 10	12	Ft. Ins. 16-5 17-0 17-5	Ft. Ins. 17-0 17-5 18-0	Ft. Ins. 17-5 18-0 18-5	Ft. Ins. 18-0 18-5 19-0	Ft. Ins. 18-5 19-0 19-5	Ft. Ins. 19-0 19-5 20-0	Ft. Ins. 19-5 20-0 20-5	Ft. Ins. 20-0 20-5 21-0	Ft. Ins. 20-5 21-0 21-5	Ft. Ins. 21-0 21-5 22-0
3 x 10	16	Ft. Ins. 15-1 15-6 16-1	Ft. Ins. 15-6 16-1 16-6	Ft. Ins. 16-1 16-6 17-1	Ft. Ins. 16-6 17-1 17-6	Ft. Ins. 17-1 17-6 18-1	Ft. Ins. 17-6 18-1 18-6	Ft. Ins. 18-1 18-6 19-1	Ft. Ins. 18-6 19-1 19-6	Ft. Ins. 19-1 19-6 20-1	Ft. Ins. 19-6 20-1 20-6
3 x 10	24	Ft. Ins. 13-4 13-9 14-4	Ft. Ins. 13-9 14-4 14-9	Ft. Ins. 14-4 14-9 15-4	Ft. Ins. 14-9 15-4 15-9	Ft. Ins. 15-4 15-9 16-4	Ft. Ins. 15-9 16-4 16-9	Ft. Ins. 16-4 16-9 17-4	Ft. Ins. 16-9 17-4 17-9	Ft. Ins. 17-4 17-9 18-4	Ft. Ins. 17-9 18-4 18-9
3 x 12	12	Ft. Ins. 19-9 20-4 20-9	Ft. Ins. 20-4 20-9 21-4	Ft. Ins. 20-9 21-4 21-9	Ft. Ins. 21-4 21-9 22-4	Ft. Ins. 21-9 22-4 22-9	Ft. Ins. 22-4 22-9 23-4	Ft. Ins. 22-9 23-4 23-9	Ft. Ins. 23-4 23-9 24-4	Ft. Ins. 23-9 24-4 24-9	Ft. Ins. 24-4 24-9 25-4
3 x 12	16	Ft. Ins. 18-2 18-7 19-2	Ft. Ins. 18-7 19-2 19-7	Ft. Ins. 19-2 19-7 20-2	Ft. Ins. 19-7 20-2 20-7	Ft. Ins. 20-2 20-7 21-2	Ft. Ins. 20-7 21-2 21-7	Ft. Ins. 21-2 21-7 22-2	Ft. Ins. 21-7 22-2 22-7	Ft. Ins. 22-2 22-7 23-2	Ft. Ins. 22-7 23-2 23-7
3 x 12	24	Ft. Ins. 16-1 16-6 17-1	Ft. Ins. 16-6 17-1 17-6	Ft. Ins. 17-1 17-6 18-1	Ft. Ins. 17-6 18-1 18-6	Ft. Ins. 18-1 18-6 19-1	Ft. Ins. 18-6 19-1 19-6	Ft. Ins. 19-1 19-6 20-1	Ft. Ins. 19-6 20-1 20-6	Ft. Ins. 20-1 20-6 21-1	Ft. Ins. 20-6 21-1 21-6
3 x 14	12	Ft. Ins. 23-1 23-6 24-1	Ft. Ins. 23-6 24-1 24-6	Ft. Ins. 24-1 24-6 25-1	Ft. Ins. 24-6 25-1 25-6	Ft. Ins. 25-1 25-6 26-1	Ft. Ins. 25-6 26-1 26-6	Ft. Ins. 26-1 26-6 27-1	Ft. Ins. 26-6 27-1 27-6	Ft. Ins. 27-1 27-6 28-1	Ft. Ins. 27-6 28-1 28-6
3 x 14	16	Ft. Ins. 21-3 21-8 22-3	Ft. Ins. 21-8 22-3 22-8	Ft. Ins. 22-3 22-8 23-3	Ft. Ins. 22-8 23-3 23-8	Ft. Ins. 23-3 23-8 24-3	Ft. Ins. 23-8 24-3 24-8	Ft. Ins. 24-3 24-8 25-3	Ft. Ins. 24-8 25-3 25-8	Ft. Ins. 25-3 25-8 26-3	Ft. Ins. 25-8 26-3 26-8
3 x 14	24	Ft. Ins. 18-9 19-4 19-9	Ft. Ins. 19-4 19-9 20-4	Ft. Ins. 19-9 20-4 20-9	Ft. Ins. 20-4 20-9 21-4	Ft. Ins. 20-9 21-4 21-9	Ft. Ins. 21-4 21-9 22-4	Ft. Ins. 21-9 22-4 22-9	Ft. Ins. 22-4 22-9 23-4	Ft. Ins. 22-9 23-4 23-9	Ft. Ins. 23-4 23-9 24-4

NOTE.—The lengths are based on:

When limited by deflection—Maximum allowable deflection of 1/360 of span length.

When determined by bending strength of the piece—Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of joist.

Weight of lath and plaster ceiling (10 pounds per square foot).

Double thickness of flooring (5 pounds per square foot).

Live load—40 pounds per square foot of floor area with plastered ceiling, or 50 pounds per square foot with ceiling unplastered.

FLOOR JOIST SPANS (50 Pound Load)

MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)											
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Determined by Bending									
		Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.									
		f=900	f=1,000	f=1,100	f=1,200	f=1,300	f=1,400	f=1,500	f=1,600	f=1,700	f=1,800
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Limited by Deflection of 1/360 of the Span									
		Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.									
		E=1,000,000	E=1,200,000	E=1,400,000	E=1,600,000	E=1,800,000	E=2,000,000	E=2,200,000	E=2,400,000	E=2,600,000	E=2,800,000
2 x 6	12	8-1	8-7	8-3	7-7	11-7	10-8	9-9	8-4	7-10	6-6
	16	7-4	7-10	6-10	5-10	10-1	9-8	8-9	7-11	6-7	5-3
	24	6-6	6-10	5-10	4-10	8-3	7-10	6-10	5-10	4-10	3-6
2 x 8	12	10-9	11-5	12-0	12-7	14-7	13-10	11-10	10-11	9-11	8-7
	16	9-9	10-5	11-0	11-6	13-7	12-10	10-10	9-11	8-11	7-7
	24	8-7	9-2	9-8	10-1	12-2	11-7	9-11	8-11	7-11	6-7
2 x 10	12	13-7	14-5	15-2	15-10	17-10	16-13	14-13	13-11	12-11	11-7
	16	12-5	13-2	13-10	14-7	16-7	15-10	13-10	12-11	11-11	10-7
	24	10-0	11-7	12-2	12-9	14-5	13-10	11-10	10-11	9-11	8-7
2 x 12	12	16-4	17-5	18-3	19-1	21-10	20-13	18-13	17-11	16-11	15-7
	16	14-11	15-10	16-9	17-6	19-6	18-10	16-10	15-11	14-11	13-7
	24	13-1	14-0	14-9	15-5	17-5	16-10	14-10	13-11	12-11	11-7
2 x 14	12	19-1	20-3	21-4	22-4	24-4	23-7	21-7	20-7	19-7	18-3
	16	17-6	18-6	19-6	20-5	22-5	21-10	19-10	18-10	17-10	16-6
	24	15-5	16-4	17-3	18-0	20-0	19-5	17-5	16-5	15-5	14-1
3 x 6	12	9-5	9-8	10-6	11-0	12-11	12-7	11-7	10-7	9-7	8-3
	16	8-7	9-1	9-7	10-0	11-6	11-0	10-0	9-0	8-0	6-6
	24	7-6	8-0	8-5	9-0	10-6	10-0	9-0	8-0	7-0	5-6
3 x 8	12	12-6	13-3	14-0	14-7	16-7	15-10	13-10	12-11	11-11	10-7
	16	11-5	12-1	12-9	13-4	15-4	14-7	12-7	11-7	10-7	9-3
	24	10-1	10-8	11-3	11-9	13-9	13-0	11-0	10-0	9-0	7-6
3 x 10	12	15-9	16-8	17-7	18-4	20-4	19-7	17-7	16-7	15-7	14-3
	16	14-5	15-3	16-1	16-10	18-10	17-13	15-13	14-13	13-13	12-9
	24	12-8	13-5	14-2	14-10	16-10	15-13	13-13	12-13	11-13	10-9
3 x 12	12	18-10	20-0	21-1	22-0	24-0	23-3	21-3	20-3	19-3	18-0
	16	17-4	18-4	19-4	20-3	22-3	21-7	19-7	18-7	17-7	16-3
	24	15-3	16-3	17-1	17-10	19-10	18-13	16-13	15-13	14-13	13-9
3 x 14	12	21-11	23-5	24-7	25-8	27-8	27-1	25-1	24-1	23-1	21-7
	16	20-2	21-5	22-7	23-8	25-8	24-11	22-11	21-11	20-11	18-7
	24	17-10	18-11	19-0	20-10	22-10	21-13	19-13	18-13	17-13	15-9

NOTE.—The lengths are based on:
 When limited by deflection—
 Maximum allowable deflection of 1/360 of span length.
 Modulus of elasticity as noted for "E."
 When determined by bending strength of the piece—
 Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of joist.
 Weight of lath and plaster ceiling (10 pounds per square foot).
 Double thickness of flooring (5 pounds per square foot).
 Live load—50 pounds per square foot of floor area with plastered ceiling, or
 60 pounds per square foot with ceiling unplastered.

FLOOR JOIST SPANS (60 Pound Load)

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED																			
Live Load 60 Pounds per Square Foot with Plastered Ceiling. Live Load 70 Pounds per Square Foot with Unplastered Ceiling.																			
MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)																			
Determined by Bending																			
Having determined by reference to the building code or the table on page 1 the allowable fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.																			
Limited by Deflection of 1/360 of the Span																			
Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.																			
E=1,000,000 E=1,200,000 E=1,400,000 E=1,600,000																			
Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins. Ft. Ins.																			
12 16 24 1																			

NOTE.—The lengths are based on:

When limited by deflection—

Maximum allowable deflection of 1/360 of span length.

Modulus of elasticity as noted for "E."

When determined by bending strength of the piece—

Allowable stress in extreme fibre in bending as noted for "f."

Dead load.—Weight of joist.

Weight of lath and plaster ceiling (10 pounds per square foot).

Double thickness of flooring (5 pounds per square foot).

Live load.—60 pounds per square foot of floor area with plastered ceiling, or

70 pounds per square foot with ceiling unplastered.

FLOOR JOIST SPANS (70 Pound Load)

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED											
Live Load 70 Pounds per Square Foot with Plastered Ceiling. Live Load 80 Pounds per Square Foot with Unplastered Ceiling.											
MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)											
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Determined by Bending									
		Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.									
		$f=900$	$f=1,000$	$f=1,100$	$f=1,200$	$f=1,300$	$f=1,400$	$f=1,500$	$f=1,600$	$f=1,700$	$f=1,800$
		Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.
		E=1,000,000	E=1,200,000	E=1,400,000	E=1,600,000	E=1,800,000	E=2,000,000	E=2,200,000	E=2,400,000	E=2,600,000	E=2,800,000
2 x 6	12	7-5	7-9	8-2	8-7	9-1	9-6	10-0	10-5	10-10	10-15
	16	6-8	7-1	7-6	8-1	8-6	9-1	9-6	10-1	10-6	10-11
	24	5-10	6-2	6-7	7-0	7-5	8-0	8-5	9-0	9-5	10-0
2 x 8	12	9-9	10-5	11-0	11-6	12-1	12-7	13-2	13-8	14-3	14-9
	16	8-10	9-6	10-0	10-6	11-1	11-7	12-2	12-8	13-3	13-9
	24	7-9	8-4	8-9	9-4	9-9	10-4	10-9	11-4	11-9	12-4
2 x 10	12	12-5	13-1	13-10	14-6	15-2	15-11	16-7	17-3	17-12	18-8
	16	11-4	12-0	12-8	13-2	13-11	14-5	15-1	15-10	16-6	17-2
	24	9-10	10-6	11-1	11-7	12-2	12-9	13-4	14-0	14-7	15-3
2 x 12	12	15-0	15-10	16-8	17-6	18-4	19-2	20-0	20-9	21-7	22-5
	16	13-8	14-6	15-4	16-0	16-9	17-5	18-3	19-1	19-10	20-8
	24	12-0	12-8	13-5	14-0	14-9	15-6	16-3	17-0	17-9	18-6
2 x 14	12	17-6	18-7	19-7	20-6	21-5	22-4	23-3	24-2	25-1	26-0
	16	16-1	17-0	17-11	18-10	19-0	19-9	20-8	21-7	22-6	23-5
	24	14-1	15-0	15-10	16-6	17-3	18-0	18-9	19-6	20-4	21-3
3 x 6	12	8-7	9-3	9-9	10-1	10-7	11-1	11-7	12-1	12-6	13-0
	16	7-11	8-5	8-10	9-3	9-8	10-1	10-6	11-0	11-5	11-9
	24	6-11	7-5	7-9	8-1	8-5	8-9	9-3	9-7	10-1	10-5
3 x 8	12	11-6	12-3	12-10	13-5	14-1	14-8	15-4	16-0	16-7	17-3
	16	10-6	11-1	11-9	12-3	12-10	13-4	13-11	14-5	15-0	15-7
	24	9-3	9-10	10-4	10-10	11-4	11-11	12-5	13-0	13-7	14-1
3 x 10	12	14-6	15-5	16-3	16-11	17-0	17-9	18-6	19-4	20-2	21-1
	16	13-3	14-0	14-10	15-5	16-3	17-1	17-10	18-7	19-4	20-2
	24	11-7	12-4	13-0	13-7	14-3	15-0	15-7	16-4	17-1	17-8
3 x 12	12	17-5	18-6	19-5	20-5	21-4	22-3	23-2	24-1	25-0	25-9
	16	15-11	16-11	17-10	18-7	19-6	20-4	21-3	22-2	23-1	24-0
	24	14-0	14-11	15-9	16-5	17-3	18-0	18-11	19-8	20-5	21-3
3 x 14	12	20-4	21-7	22-7	23-9	24-10	25-1	26-2	27-3	28-4	29-5
	16	18-7	19-10	20-11	21-10	22-1	23-2	24-3	25-4	26-5	27-6
	24	16-5	17-6	18-5	19-3	20-2	21-1	22-0	22-11	23-10	24-9
4 x 6	12	9-7	10-3	10-9	11-3	11-11	12-5	13-0	13-8	14-2	14-10
	16	8-9	9-4	9-10	10-3	10-10	11-4	11-11	12-4	12-11	13-4
	24	7-9	8-1	8-7	9-0	9-7	10-1	10-8	11-1	11-8	12-1
4 x 8	12	12-9	13-6	14-3	14-10	15-7	16-4	17-1	17-10	18-7	19-4
	16	11-7	12-4	13-0	13-7	14-4	15-1	15-8	16-5	17-2	17-10
	24	10-3	10-10	11-5	12-0	12-7	13-2	13-9	14-4	14-11	15-6
4 x 10	12	15-11	16-11	17-10	18-7	19-6	20-4	21-3	22-2	23-1	24-0
	16	14-7	15-6	16-5	17-1	18-0	18-11	19-10	20-9	21-8	22-7
	24	12-11	13-9	14-5	15-3	16-0	16-11	17-10	18-9	19-8	20-7

NOTE.—The lengths are based on:
 When limited by deflection—
 Maximum allowable deflection of 1/360 of span length.
 Modulus of elasticity as noted for "E."
 When determined by bending strength of the piece—
 Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of joist.
 Weight of lath and plaster ceiling (10 pounds per square foot).
 Double thickness of flooring (5 pounds per square foot).
 Live load—70 pounds per square foot of floor area with plastered ceiling, or
 80 pounds per square foot with ceiling unplastered.

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED

Live Load 80 Pounds per Square Foot with Plastered Ceiling. Live Load 90 Pounds per Square Foot with Unplastered Ceiling.

FLOOR JOIST SPANS (80 Pound Load)

Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)																												
		Limited by Deflection of 1/360 of the Span								Spans Determined by Bending (Read Carefully)																				
		E=1,000,000		E=1,200,000		E=1,400,000		E=1,600,000		f=900		f=1,000		f=1,100		f=1,200		f=1,300		f=1,400		f=1,500		f=1,600		f=1,700		f=1,800		
Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	Ft.	Ins.	
2 x 6	12	7-1	7-7	8-0	8-4	7-2	7-7	8-0	8-4	7-2	7-7	8-0	8-4	7-2	7-7	8-0	8-4	7-2	7-7	8-0	8-4	7-2	7-7	8-0	8-4	7-2	7-7	8-0	8-4	
	16	6-6	6-10	7-2	7-7	6-4	6-9	7-7	7-11	6-4	6-9	7-7	8-0	8-4	6-10	6-10	7-2	7-7	8-0	8-4	6-10	6-10	7-2	7-7	8-0	8-4	6-10	6-10	7-2	7-7
2 x 8	12	9-6	10-1	10-7	11-1	9-7	10-1	10-7	11-1	9-7	10-1	10-7	11-1	9-7	10-1	10-7	11-1	9-7	10-1	10-7	11-1	9-7	10-1	10-7	11-1	9-7	10-1	10-7	11-1	9-7
	16	8-7	9-3	9-7	10-1	8-4	8-9	9-7	10-1	8-4	8-9	9-7	10-1	8-4	8-9	9-7	10-1	8-4	8-9	9-7	10-1	8-4	8-9	9-7	10-1	8-4	8-9	9-7	10-1	8-4
2 x 10	12	12-0	12-8	13-5	14-0	12-1	12-9	13-5	14-0	12-1	12-9	13-5	14-0	12-1	12-9	13-5	14-0	12-1	12-9	13-5	14-0	12-1	12-9	13-5	14-0	12-1	12-9	13-5	14-0	12-1
	16	10-10	11-7	12-2	12-9	10-6	10-6	11-1	11-8	10-6	10-6	11-1	11-8	10-6	10-6	11-1	11-8	10-6	10-6	11-1	11-8	10-6	10-6	11-1	11-8	10-6	10-6	11-1	11-8	10-6
2 x 12	12	14-5	15-5	16-2	16-10	14-7	14-7	15-5	16-1	14-7	14-7	15-5	16-1	14-7	14-7	15-5	16-1	14-7	14-7	15-5	16-1	14-7	14-7	15-5	16-1	14-7	14-7	15-5	16-1	14-7
	16	13-2	14-0	14-9	15-5	12-8	12-8	13-5	14-1	12-8	12-8	13-5	14-1	12-8	12-8	13-5	14-1	12-8	12-8	13-5	14-1	12-8	12-8	13-5	14-1	12-8	12-8	13-5	14-1	12-8
2 x 14	12	16-11	18-0	19-0	19-10	17-1	17-1	18-0	18-11	17-1	17-1	18-0	18-11	17-1	17-1	18-0	18-11	17-1	17-1	18-0	18-11	17-1	17-1	18-0	18-11	17-1	17-1	18-0	18-11	17-1
	16	15-5	16-5	17-4	18-1	14-11	14-11	15-9	16-6	14-11	14-11	15-9	16-6	14-11	14-11	15-9	16-6	14-11	14-11	15-9	16-6	14-11	14-11	15-9	16-6	14-11	14-11	15-9	16-6	14-11
3 x 6	12	8-4	8-11	9-4	9-9	7-11	7-11	8-5	8-11	7-11	7-11	8-5	8-11	7-11	7-11	8-5	8-11	7-11	7-11	8-5	8-11	7-11	7-11	8-5	8-11	7-11	7-11	8-5	8-11	7-11
	16	7-7	8-1	8-6	8-11	6-7	6-7	7-11	7-11	6-7	6-7	7-11	7-11	6-7	6-7	7-11	7-11	6-7	6-7	7-11	7-11	6-7	6-7	7-11	7-11	6-7	6-7	7-11	7-11	6-7
3 x 8	12	11-1	11-10	12-5	12-11	10-7	10-7	12-10	12-10	10-7	10-7	12-10	12-10	10-7	10-7	12-10	12-10	10-7	10-7	12-10	12-10	10-7	10-7	12-10	12-10	10-7	10-7	12-10	12-10	10-7
	16	10-1	10-10	11-4	11-10	9-9	9-9	11-9	11-9	9-9	9-9	11-9	11-9	9-9	9-9	11-9	11-9	9-9	9-9	11-9	11-9	9-9	9-9	11-9	11-9	9-9	9-9	11-9	11-9	9-9
3 x 10	12	14-0	14-10	15-7	16-4	13-4	13-4	16-1	16-10	13-4	13-4	16-1	16-10	13-4	13-4	16-1	16-10	13-4	13-4	16-1	16-10	13-4	13-4	16-1	16-10	13-4	13-4	16-1	16-10	13-4
	16	12-10	13-6	14-4	14-11	11-0	11-0	14-0	14-9	11-0	11-0	14-0	14-9	11-0	11-0	14-0	14-9	11-0	11-0	14-0	14-9	11-0	11-0	14-0	14-9	11-0	11-0	14-0	14-9	11-0
3 x 12	12	16-10	17-10	18-10	19-9	16-0	16-0	19-4	19-9	16-0	16-0	19-4	19-9	16-0	16-0	19-4	19-9	16-0	16-0	19-4	19-9	16-0	16-0	19-4	19-9	16-0	16-0	19-4	19-9	16-0
	16	15-5	16-4	17-3	18-0	15-3	15-3	18-0	18-11	15-3	15-3	18-0	18-11	15-3	15-3	18-0	18-11	15-3	15-3	18-0	18-11	15-3	15-3	18-0	18-11	15-3	15-3	18-0	18-11	15-3
3 x 14	12	19-7	20-10	21-11	23-0	21-4	21-4	23-6	24-7	21-4	21-4	23-6	24-7	21-4	21-4	23-6	24-7	21-4	21-4	23-6	24-7	21-4	21-4	23-6	24-7	21-4	21-4	23-6	24-7	21-4
	16	18-0	19-1	20-1	21-1	18-9	18-9	20-9	21-7	18-9	18-9	20-9	21-7	18-9	18-9	20-9	21-7	18-9	18-9	20-9	21-7	18-9	18-9	20-9	21-7	18-9	18-9	20-9	21-7	18-9
4 x 6	12	9-4	9-10	10-5	10-10	9-4	9-4	11-4	11-10	9-4	9-4	11-4	11-10	9-4	9-4	11-4	11-10	9-4	9-4	11-4	11-10	9-4	9-4	11-4	11-10	9-4	9-4	11-4	11-10	9-4
	16	8-6	9-0	9-5	9-11	8-4	8-4	10-4	10-10	8-4	8-4	10-4	10-10	8-4	8-4	10-4	10-10	8-4	8-4	10-4	10-10	8-4	8-4	10-4	10-10	8-4	8-4	10-4	10-10	8-4
4 x 8	12	12-3	13-0	13-9	14-4	12-1	12-1	14-1	14-11	12-1	12-1	14-1	14-11	12-1	12-1	14-1	14-11	12-1	12-1	14-1	14-11	12-1	12-1	14-1	14-11	12-1	12-1	14-1	14-11	12-1
	16	11-3	11-11	12-6	13-1	11-0	11-0	13-0	13-7	11-0	11-0	13-0	13-7	11-0	11-0	13-0	13-7	11-0	11-0	13-0	13-7	11-0	11-0	13-0	13-7	11-0	11-0	13-0	13-7	11-0
4 x 10	12	15-5	16-5	17-4	18-0	15-6	15-6	17-9	18-7	15-6	15-6	17-9	18-7	15-6	15-6	17-9	18-7	15-6	15-6	17-9	18-7	15-6	15-6	17-9	18-7	15-6	15-6	17-9	18-7	15-6
	16	14-1	15-0	15-10	16-6	14-1	14-1	16-10	16-6	14-1	14-1	16-10	16-6	14-1	14-1	16-10	16-6	14-1	14-1	16-10	16-6	14-1	14-1	16-10	16-6	14-1	14-1	16-10	16-6	14-1
4 x 10	24	12-5	13-3	13-11	14-6	12-10	12-10	14-1	14-6	12-10	12-10	14-1	14-6	12-10	12-10	14-1	14-6	12-10	12-10	14-1	14-6	12-10	12-10	14-1	14-6	12-10	12-10	14-1	14-6	12-10

NOTE.—The lengths are based on:
When limited by deflection.

Dead load—Weight of joist.

FLOOR JOIST SPANS (80 Pound Load)

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED		MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)											
Live Load 80 Pounds per Square Foot with Plastered Ceiling		Live Load 90 Pounds per Square Foot with Unplastered Ceiling											
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Spans Limited by Horizontal Shear (Read Carefully)											
		Having determined by reference to the building code or the table on page 1 the horizontal shear stress in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine the span limited by its bending strength stress. THEN refer to the tables on page 8 and in the same manner determine the span of the joist limited by its bending strength and use the shorter of the two spans.											
		S=70	S=75	S=80	S=85	S=90	S=95	S=100	S=105	S=110	S=120	S=125	
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	
2 x 6	12	8-10	9-5	10-0	10-7	11-2	11-10	12-6	13-1	13-8	15-0	15-7	
	16	6-7	7-1	7-6	8-0	8-6	9-0	9-5	9-10	10-5	11-4	11-9	
2 x 8	12	11-7	12-5	13-2	14-0	14-10	15-8	16-6	17-5	18-2	19-9	20-7	
	16	8-9	9-5	10-0	10-7	11-2	11-10	12-6	13-1	13-9	15-0	15-7	
2 x 10	12	5-10	6-4	6-8	7-1	7-7	8-0	8-5	8-9	9-2	10-1	10-6	
	16	14-6	15-6	16-7	17-7	18-8	19-8	20-8	21-9	22-9	24-10	25-10	
2 x 12	12	11-0	11-9	12-7	13-5	14-2	14-10	15-8	16-6	17-4	18-10	19-8	
	16	7-5	7-10	8-6	9-0	9-6	10-1	10-7	11-1	11-8	12-8	13-2	
2 x 14	12	17-5	18-8	19-10	21-1	22-5	23-7	24-10	26-1	27-5	29-9	30-0	
	16	13-2	14-2	15-1	16-1	17-0	18-0	18-10	19-10	20-9	22-8	23-7	
3 x 6	12	8-10	9-7	10-2	10-10	11-6	12-1	12-9	13-5	14-0	15-4	16-0	
	16	20-2	21-7	23-0	24-6	25-10	27-5	28-9	30-0	31-5	33-0	34-0	
3 x 8	12	15-5	16-6	17-7	18-8	19-9	20-10	22-0	23-1	24-2	26-5	27-6	
	16	10-5	11-2	11-10	12-8	13-5	14-1	14-10	15-7	16-5	17-10	18-7	
3 x 10	12	13-10	14-10	15-10	16-10	17-10	18-10	19-9	20-9	21-9	23-9	24-9	
	16	10-6	11-4	12-0	12-9	13-6	14-4	15-1	15-9	16-7	18-1	18-9	
3 x 12	12	7-1	7-7	8-1	8-7	9-1	9-7	10-1	10-7	11-2	12-2	12-8	
	16	18-2	19-7	20-10	22-2	23-6	24-9	26-1	27-5	28-8	30-0	30-0	
3 x 14	12	13-10	14-10	15-10	16-10	17-10	18-9	19-9	20-9	21-9	23-9	24-9	
	16	9-5	10-1	10-8	11-5	12-1	12-8	13-5	14-1	14-9	16-1	16-9	
4 x 6	12	22-9	24-5	26-0	27-8	29-4	30-0	31-5	33-0	34-0	36-0	37-0	
	16	17-5	18-7	19-10	21-1	22-5	23-7	24-9	26-1	27-4	29-9	30-0	
4 x 8	12	11-9	12-7	13-6	14-4	15-2	16-0	16-10	17-8	18-6	20-2	21-1	
	16	27-2	29-1	30-0	31-5	32-5	34-0	35-0	36-0	37-0	39-0	40-0	
4 x 10	12	20-9	22-4	23-9	25-4	26-9	28-4	29-8	31-3	32-8	34-3	35-8	
	16	14-2	15-2	16-2	17-2	18-2	19-2	20-2	21-2	22-4	24-4	25-4	
4 x 12	12	30-0	31-5	33-0	34-5	36-0	37-5	39-0	40-5	42-0	44-0	45-0	
	16	24-2	25-10	26-10	27-10	28-10	29-10	30-10	31-10	32-10	34-10	35-10	
4 x 14	12	16-6	17-8	18-10	19-10	20-10	21-2	22-2	23-7	24-9	26-0	27-6	
	16	18-10	20-4	21-7	23-0	24-4	25-8	27-0	28-5	29-8	30-0	31-5	
4 x 16	12	14-5	15-5	16-5	17-6	18-6	19-6	20-7	21-7	22-7	24-8	25-8	
	16	9-8	10-5	11-1	11-9	12-6	13-2	13-10	14-7	15-4	16-8	17-5	
4 x 18	12	24-8	26-6	28-2	30-0	31-6	33-2	34-8	36-4	38-0	40-0	41-6	
	16	18-10	20-2	21-7	22-10	23-6	25-7	27-0	28-4	29-8	30-0	31-5	
4 x 20	12	12-9	13-8	14-8	15-7	16-6	17-5	18-4	19-2	20-2	22-0	22-10	
	16	30-0	25-2	26-10	28-7	29-6	31-9	33-0	34-1	35-4	37-7	38-8	
4 x 22	12	23-7	25-2	26-10	28-7	29-6	31-9	33-0	34-1	35-4	37-7	38-8	
	16	16-1	17-2	18-5	19-6	20-8	21-9	23-0	24-1	25-4	27-7	28-8	

NOTE.—The lengths are based on:
 Allowable horizontal shear stress as noted for "S."
 Dead load—Weight of joist.
 Weight of lath and plaster ceiling (10 pounds per square foot).
 Double thickness of flooring (5 pounds per square foot).
 Live load—80 pounds per square foot of floor area with plastered ceiling, or
 90 pounds per square foot with ceiling unplastered.

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED
Live Load 90 Pounds per Square Foot with Plastered Ceiling. Live Load 100 Pounds per Square Foot with Unplastered Ceiling.

FLOOR JOIST SPANS (90 Pound Load)

		MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)																											
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Limited by Deflection of 1/360 of the Span						Spans Determined by Bending (Read Carefully)																					
		Having code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.						Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of timber used, refer to the column below with the corresponding value to determine the span limited by the bending strength of the joist. THEN refer to the table on page 11 and in the same manner determine the span of the joist limited by horizontal shear and use the shorter of the two spans.																					
		E=1,000,000		E=1,200,000		E=1,400,000		E=1,600,000		f=900		f=1,000		f=1,100		f=1,200		f=1,300		f=1,400		f=1,500		f=1,600		f=1,700		f=1,800	
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
2 x 6	12	6-10	7-4	7-4	8-1	8-1	8-1	8-1	6-10	7-2	7-2	7-2	7-2	7-2	8-0	8-4	8-4	8-4	8-4	8-7	8-10	8-10	9-2	9-2	9-2	9-5	9-5	9-5	9-9
	16	6-4	6-8	7-0	7-4	7-4	7-4	7-4	6-0	6-4	6-4	6-4	6-4	6-4	6-10	7-2	7-2	7-2	7-2	7-6	7-6	7-8	8-0	8-0	8-2	8-2	8-2	8-5	8-5
2 x 8	12	9-2	9-8	9-4	10-4	10-4	10-4	10-4	9-1	9-8	9-8	9-8	9-8	9-8	10-6	11-0	11-0	11-0	11-0	11-5	11-5	11-9	12-2	12-2	12-2	12-7	12-7	12-7	13-0
	16	8-4	8-10	9-4	9-4	9-4	9-4	9-4	8-0	8-5	8-5	8-5	8-5	8-5	9-2	9-6	9-6	9-6	9-6	9-10	9-10	10-7	11-0	11-0	11-4	11-4	11-4	11-8	11-8
2 x 10	12	11-7	12-4	13-0	13-7	13-7	13-7	13-7	11-6	12-2	12-2	12-2	12-2	12-2	13-4	13-10	13-10	13-10	13-10	14-5	14-5	14-10	15-5	15-5	15-10	16-4	16-4	16-4	16-8
	16	10-7	11-2	11-9	12-5	12-5	12-5	12-5	10-1	10-7	10-7	10-7	10-7	10-7	11-7	12-1	12-1	12-1	12-1	12-7	12-7	13-0	13-5	13-5	13-9	14-2	14-2	14-2	14-6
2 x 12	12	14-0	14-10	15-8	16-5	16-5	16-5	16-5	13-10	14-8	14-8	14-8	14-8	14-8	16-1	16-8	16-8	16-8	16-8	17-5	17-5	18-0	19-4	19-4	19-8	20-2	20-2	20-2	20-6
	16	12-9	13-7	14-3	14-10	14-10	14-10	14-10	12-1	12-9	12-9	12-9	12-9	12-9	14-0	14-7	14-7	14-7	14-7	15-2	15-2	15-8	16-2	16-2	16-8	17-2	17-2	17-2	17-6
2 x 14	12	16-5	17-6	18-5	19-3	19-3	19-3	19-3	16-4	17-3	17-3	17-3	17-3	17-3	18-10	19-7	19-7	19-7	19-7	20-4	20-4	21-0	22-5	22-5	23-0	23-4	23-4	23-4	23-8
	16	15-0	16-11	16-10	17-6	17-6	17-6	17-6	14-3	15-0	15-0	15-0	15-0	15-0	16-5	17-1	17-1	17-1	17-1	17-9	17-9	18-5	19-9	19-9	20-1	20-1	20-1	20-5	20-9
3 x 6	12	8-1	8-7	9-0	9-6	9-6	9-6	9-6	8-9	9-3	9-3	9-3	9-3	9-3	10-0	10-6	10-6	10-6	10-6	10-11	10-11	11-4	11-7	11-7	12-0	12-4	12-4	12-4	12-8
	16	7-5	7-10	8-3	8-7	8-7	8-7	8-7	7-7	8-0	8-0	8-0	8-0	8-0	8-10	9-1	9-1	9-1	9-1	9-6	9-6	9-10	10-1	10-1	10-5	10-9	10-9	10-9	11-3
3 x 8	12	10-9	11-5	12-0	12-6	12-6	12-6	12-6	11-6	12-3	12-3	12-3	12-3	12-3	13-4	14-0	14-0	14-0	14-0	14-5	14-5	14-11	15-5	15-5	16-4	16-8	16-8	16-8	17-2
	16	9-10	10-5	11-0	11-6	11-6	11-6	11-6	10-0	10-7	10-7	10-7	10-7	10-7	11-7	12-3	12-3	12-3	12-3	12-7	12-7	13-0	13-5	13-5	14-3	14-7	14-7	14-7	15-1
3 x 10	12	13-6	14-5	15-1	15-10	15-10	15-10	15-10	14-6	15-4	15-4	15-4	15-4	15-4	16-10	17-6	17-6	17-6	17-6	18-1	18-1	18-10	19-4	19-4	20-0	20-6	20-6	20-6	21-0
	16	12-5	13-3	13-10	14-6	14-6	14-6	14-6	12-9	13-4	13-4	13-4	13-4	13-4	14-9	15-3	15-3	15-3	15-3	15-10	15-10	16-5	16-11	16-11	17-5	17-11	17-11	17-11	17-15
3 x 12	12	16-4	17-4	18-3	19-1	19-1	19-1	19-1	17-6	18-5	18-5	18-5	18-5	18-5	20-3	21-0	21-0	21-0	21-0	21-10	21-10	22-6	23-4	23-4	24-0	24-6	24-6	24-6	25-0
	16	14-11	15-10	16-9	17-3	17-3	17-3	17-3	15-4	16-1	16-1	16-1	16-1	16-1	17-7	18-5	18-5	18-5	18-5	19-1	19-1	19-9	20-5	20-5	21-0	21-7	21-7	21-7	22-1
3 x 14	12	19-1	20-3	21-4	22-4	22-4	22-4	22-4	20-5	21-6	21-6	21-6	21-6	21-6	23-6	24-6	24-6	24-6	24-6	25-5	25-5	26-4	27-3	27-3	28-0	28-6	28-6	28-6	29-0
	16	17-6	18-6	19-6	20-5	20-5	20-5	20-5	18-10	19-9	19-9	19-9	19-9	19-9	20-7	21-5	21-5	21-5	21-5	22-3	22-3	23-0	23-10	23-10	24-6	25-3	25-3	25-3	26-0
4 x 6	12	9-0	9-6	10-0	10-6	10-6	10-6	10-6	10-3	10-9	10-9	10-9	10-9	10-9	11-9	12-3	12-3	12-3	12-3	12-9	12-9	13-3	13-7	13-7	14-0	14-5	14-5	14-5	14-9
	16	8-3	8-9	9-1	9-7	9-7	9-7	9-7	8-11	9-4	9-4	9-4	9-4	9-4	10-3	10-9	10-9	10-9	10-9	11-0	11-0	11-5	11-10	11-10	12-2	12-6	12-6	12-6	13-0
4 x 8	12	11-11	12-7	13-4	13-11	13-11	13-11	13-11	13-6	14-3	14-3	14-3	14-3	14-3	15-7	16-3	16-3	16-3	16-3	16-10	16-10	17-5	17-11	17-11	18-6	19-0	19-0	19-0	19-4
	16	10-10	11-6	12-1	12-9	12-9	12-9	12-9	11-9	12-5	12-5	12-5	12-5	12-5	13-7	14-1	14-1	14-1	14-1	14-9	14-9	15-3	15-9	15-9	16-3	16-7	16-7	16-7	17-1
4 x 10	12	15-0	15-11	16-9	17-6	17-6	17-6	17-6	16-11	17-10	17-10	17-10	17-10	17-10	18-9	19-6	19-6	19-6	19-6	20-4	20-4	21-10	22-6	22-6	23-4	23-9	23-9	23-9	24-3
	16	13-9	14-6	15-4	16-1	16-1	16-1	16-1	14-10	15-7	15-7	15-7	15-7	15-7	17-1	17-10	17-10	17-10	17-10	18-5	18-5	19-1	19-9	19-9	20-4	20-8	20-8	20-8	21-2
4 x 12	12	18-0	18-10	19-8	20-5	20-5	20-5	20-5	18-11	19-10	19-10	19-10	19-10	19-10	20-9	21-6	21-6	21-6	21-6	22-7	22-7	23-11	24-7	24-7	25-3	25-7	25-7	25-7	26-1
	16	16-0	16-11	17-9	18-6	18-6	18-6	18-6	16-10	17-7	17-7	17-7	17-7	17-7	18-6	19-3	19-3	19-3	19-3	20-4	20-4	21-10	22-6	22-6	23-3	23-7	23-7	23-7	24-1

NOTE: The lengths are based on:

NOTE.—The lengths are based on:
When limited by deflection—Maximum allowable deflection of 1/360 of span length.
When determined by bending strength of the piece—Allowable stress in extreme fibre in bending as noted for "f."
Dead load—Weight of joist.
Weight of lath and plaster ceiling (10 pounds per square foot).
Double thickness of flooring (5 pounds per square foot).
Live load—90 pounds per square foot of floor area with plastered ceiling, or 100 pounds per square foot with ceiling unplastered.

FLOOR JOIST SPANS (90 Pound Load)

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED													
Live Load 90 Pounds per Square Foot with Plastered Ceiling. Live Load 100 Pounds per Square Foot with Unplastered Ceiling.													
MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)													
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Spans Limited by Horizontal Shear (Read Carefully)											
		Having determined by reference to the building code or the table on page 1 the horizontal shear stress in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine the span limited by the horizontal shear stress. THEN refer to the tables on page 10 and in the same manner determine the span of the joist limited by its bending strength and use the shorter of the two spans.											
		S=70	S=75	S=80	S=85	S=90	S=95	S=100	S=105	S=110	S=120	S=125	
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	
2 x 6	12	7-10	8-6	9-1	9-7	10-2	10-9	11-4	11-10	12-6	13-7	14-2	
	16	6-0	6-5	6-9	7-4	7-8	8-1	8-6	9-0	9-5	10-4	10-8	
2 x 8	12	10-6	11-2	12-0	12-8	13-6	14-2	15-0	15-8	16-6	18-0	18-8	
	16	7-10	8-6	9-1	9-7	10-2	10-9	11-4	11-10	12-6	13-7	14-2	
2 x 10	12	13-2	14-1	15-1	16-0	17-0	17-10	18-9	19-5	20-8	22-7	23-6	
	16	10-0	10-8	11-5	12-1	12-9	13-7	14-4	15-0	15-8	17-1	17-9	
	24	6-8	7-2	7-8	8-2	8-7	9-1	9-7	10-1	10-7	11-6	12-0	
2 x 12	12	15-9	17-0	18-1	19-2	20-5	21-6	22-7	23-9	24-10	27-1	28-4	
	16	12-0	12-10	13-8	14-7	15-5	16-4	17-2	18-0	18-10	20-7	21-6	
	24	8-1	8-8	9-4	9-9	10-5	11-0	11-7	12-2	12-8	13-10	14-6	
2 x 14	12	18-5	19-8	21-0	22-4	23-7	24-10	26-2	27-6	28-9	30-0	30-0	
	16	14-0	15-0	16-0	17-0	18-0	19-0	20-0	21-0	22-0	24-0	25-0	
	24	9-6	10-1	10-9	11-6	12-2	12-9	13-6	14-2	14-10	16-2	16-10	
3 x 6	12	12-7	13-6	14-5	15-4	16-2	17-1	18-0	18-10	19-9	21-7	22-6	
	16	9-7	10-2	10-10	11-7	12-4	13-0	13-8	14-4	15-0	16-5	17-1	
3 x 8	12	16-7	17-9	19-0	20-2	21-4	22-6	23-8	24-10	26-1	28-6	29-7	
	16	12-7	13-6	14-5	15-4	16-2	17-1	18-0	18-10	19-9	21-7	22-6	
	24	8-6	9-1	9-8	10-5	11-0	11-7	12-2	12-9	13-5	14-7	15-2	
3 x 10	12	20-8	22-2	23-8	25-2	26-8	28-1	29-7	30-0	30-0	30-0	30-0	
	16	15-9	16-10	18-1	19-2	20-4	21-6	22-7	23-8	24-9	27-1	28-2	
	24	10-8	11-6	12-2	13-0	13-9	14-6	15-4	16-1	16-9	18-5	19-1	
3 x 12	12	24-9	26-3	28-4	30-0	31-6	33-2	34-8	36-4	38-0	40-0	41-6	
	16	18-10	20-4	21-7	23-0	24-5	25-8	27-1	28-5	29-9	30-0	30-0	
	24	12-10	13-9	14-8	15-7	16-7	17-6	18-5	19-4	20-2	22-1	23-0	
3 x 14	12	28-8	30-0	32-2	34-4	36-6	38-8	41-0	43-2	45-4	48-6	50-8	
	16	22-0	23-7	25-2	26-8	28-4	29-10	30-0	31-6	33-2	35-8	38-0	
	24	15-0	16-1	17-2	18-2	19-4	20-5	21-6	22-6	23-7	25-8	26-9	
4 x 6	12	17-2	18-5	19-8	20-10	22-1	23-4	24-7	25-9	27-0	29-6	30-0	
	16	13-1	14-0	14-10	15-10	16-9	17-8	18-8	19-7	20-6	22-5	23-4	
	24	8-9	9-6	10-1	10-8	11-4	12-0	12-7	13-2	13-10	15-1	15-9	
4 x 8	12	22-6	24-1	25-8	27-4	28-10	30-0	31-6	33-2	34-8	37-4	39-0	
	16	17-2	18-5	19-7	20-10	22-1	23-4	24-6	25-9	27-0	29-5	30-0	
	24	11-8	12-6	13-4	14-1	15-0	15-9	16-7	17-6	18-4	20-0	20-9	
4 x 10	12	28-0	30-0	32-0	34-0	36-0	38-0	40-0	42-0	44-0	46-0	48-0	
	16	21-5	23-0	24-5	26-0	27-5	29-0	30-5	32-0	33-5	35-0	36-5	
	24	14-7	15-8	16-8	17-9	18-9	19-9	20-10	21-10	23-0	25-1	26-1	

NOTE.—The lengths are based on:
Allowable horizontal shear stress as noted for "S."
Dead load—Weight of joist.
Weight of lath and plaster ceiling (10 pounds per square foot).
Double thickness of flooring (5 pounds per square foot).
Live load—90 pounds per square foot of floor area with plastered ceiling, or 100 pounds per square foot with ceiling unplastered.

FLOOR JOIST SPANS (100 Pound Load)

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED											
Live Load 100 Pounds per Square Foot with Plastered Ceiling. Live Load 110 Pounds per Square Foot with Unplastered Ceiling.											
MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)											
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Spans Determined by Bending (Read Carefully)									
		Having determined by reference to the building code or the table on page 1 the allowable stress in bending in pounds per square inch for the species and grade of timber used, refer to the column below with the corresponding value to determine the span limited by the bending strength of the joist. THEN refer to the table on page 13 and in the same manner determine the span of the joist limited by horizontal shear and use the shorter of the two spans.									
		Limited by Deflection of 1/360 of the Span Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.									
		E=1,000,000		E=1,200,000		E=1,400,000		E=1,600,000		E=1,800,000	
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
2 x 8	12	8-10	9-5	9-5	10-0	10-0	10-5	10-5	11-0	11-0	11-5
	16	8-1	8-7	8-7	9-1	9-1	9-6	9-6	10-1	10-1	10-6
2 x 10	12	11-2	12-0	12-0	13-2	13-2	14-0	14-0	14-8	14-8	15-2
	16	10-2	10-10	10-10	11-6	11-6	12-0	12-0	12-9	12-9	13-2
2 x 12	12	13-7	14-5	14-5	15-2	15-2	16-0	16-0	16-9	16-9	17-4
	16	12-5	13-2	13-2	14-0	14-0	14-6	14-6	15-0	15-0	15-6
2 x 14	12	16-0	16-11	16-11	17-10	17-10	18-9	18-9	19-6	19-6	20-4
	16	14-6	15-6	15-6	16-4	16-4	17-0	17-0	17-7	17-7	18-4
3 x 6	12	7-11	8-4	8-4	9-3	9-3	10-0	10-0	10-5	10-5	11-0
	16	7-3	7-7	7-7	8-0	8-0	8-5	8-5	9-1	9-1	9-6
3 x 8	12	10-6	11-1	11-1	12-3	12-3	13-0	13-0	13-10	13-10	14-4
	16	9-6	10-1	10-1	10-9	10-9	11-1	11-1	11-9	11-9	12-5
3 x 10	12	13-3	14-0	14-0	15-5	15-5	16-9	16-9	17-5	17-5	18-9
	16	12-0	12-9	12-9	13-5	13-5	14-0	14-0	14-7	14-7	15-3
3 x 12	12	15-10	16-10	16-10	17-9	17-9	18-6	18-6	19-4	19-4	20-4
	16	14-6	15-5	15-5	16-3	16-3	16-11	16-11	17-7	17-7	18-11
3 x 14	12	18-6	19-9	19-9	20-9	20-9	21-9	21-9	22-7	22-7	23-9
	16	16-11	18-0	18-0	19-0	19-0	19-10	19-10	20-6	20-6	21-9
4 x 6	12	8-9	9-4	9-4	10-3	10-3	11-0	11-0	11-9	11-9	12-5
	16	8-0	8-5	8-5	9-4	9-4	10-0	10-0	10-7	10-7	11-4
4 x 8	12	11-6	12-3	12-3	13-6	13-6	14-11	14-11	15-6	15-6	16-9
	16	10-6	11-3	11-3	12-4	12-4	13-0	13-0	13-7	13-7	14-4
4 x 10	12	14-6	15-5	15-5	16-4	16-4	17-0	17-0	17-7	17-7	18-4
	16	13-4	14-1	14-1	14-11	14-11	15-9	15-9	16-6	16-6	17-4

NOTE.—The lengths are based on:
When limited by deflection—
Maximum allowable deflection of 1/360 of span length.
Modulus of elasticity as noted for “E.”
When determined by bending strength of the piece—
Allowable stress in extreme fibre in bending as noted for “f.”

Dead load.—Weight of joist.
Weight of lath and plaster ceiling (10 pounds per square foot).
Double thickness of flooring (5 pounds per square foot).
Live load—100 pounds per square foot of floor area with plastered ceiling, or
110 pounds per square foot with ceiling unplastered.

NOTE.—The lengths are based on:
 When limited by deflection—
 Maximum allowable deflection of 1/360 of span length.
 Modulus of elasticity as noted for "E."
 When determined by bending strength of the piece—
 Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of joist.
 Weight of lath and plaster ceiling (10 pounds per square foot).
 Double thickness of flooring (15 pounds per square foot).
 Live load—100 pounds per square foot of floor area with plastered ceiling, or
 110 pounds per square foot with ceiling unplastered.

FLOOR JOIST SPANS (100 Pound Load)

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED												
Live Load 100 Pounds per Square Foot with Plastered Ceiling. Live Load 110 Pounds per Square Foot with Unplastered Ceiling.												
MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)												
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Spans Limited by Horizontal Shear (Read Carefully)										
		Having determined by reference to the building code or the table on page 1 the horizontal shear stress in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine the span limited by the horizontal shear stress. THEN refer to the tables on page 12 and in the same manner determine the span of the joist limited by its bending strength and use the shorter of the two spans.										
		S=70	S=75	S=80	S=85	S=90	S=95	S=100	S=105	S=110	S=120	S=125
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
2 x 8	12	9-7	10-4	11-0	11-8	12-5	13-0	13-8	14-5	15-1	16-6	17-2
	16	7-4	8-9	9-4	8-9	9-4	9-10	10-5	10-10	11-5	12-5	13-0
2 x 10	12	12-1	12-10	13-9	14-8	15-6	16-5	17-4	18-1	19-0	20-8	21-7
	16	9-1	9-9	10-6	11-1	11-9	12-5	13-1	13-8	14-5	15-8	16-4
	24	6-2	6-7	7-0	7-6	7-10	8-4	8-9	9-2	9-8	10-6	11-0
2 x 12	12	14-6	15-7	16-7	17-7	18-8	19-8	20-8	21-9	22-9	24-10	25-10
	16	11-0	11-9	12-7	13-5	14-2	14-10	15-8	16-6	17-4	18-10	19-8
	24	7-5	7-10	8-6	9-0	9-6	10-1	10-7	11-1	11-8	12-8	13-2
2 x 14	12	16-9	18-1	19-4	20-6	21-8	22-10	24-1	25-4	26-6	28-10	30-0
	16	12-9	13-8	14-7	15-7	16-6	17-5	18-4	19-2	20-1	22-0	22-10
	24	8-8	9-4	9-10	10-6	11-1	11-8	12-5	13-0	13-7	14-9	15-6
3 x 6	12	11-7	12-5	13-2	14-0	14-10	15-8	16-6	17-4	18-2	19-9	20-8
	16	8-9	9-5	10-0	10-7	11-4	11-10	12-6	13-1	13-9	15-0	15-7
	24	5-5	5-10	6-1	6-6	7-1	7-6	8-1	8-6	9-1	10-1	10-6
3 x 8	12	15-2	16-4	17-5	18-6	19-7	20-8	21-8	22-9	23-10	26-1	27-2
	16	11-7	12-5	13-2	14-0	14-10	15-8	16-6	17-4	18-2	19-9	20-7
	24	7-9	8-5	8-10	9-6	10-0	10-7	11-1	11-8	12-4	13-5	13-10
3 x 10	12	19-0	20-5	21-9	23-1	24-6	25-9	27-2	28-7	29-10	30-0	30-0
	16	14-6	15-6	16-7	17-7	18-7	19-8	20-8	21-9	22-9	24-10	25-10
	24	9-9	10-6	11-2	11-10	12-7	13-4	14-0	14-8	15-5	16-9	17-6
3 x 12	12	22-9	24-5	26-0	27-7	29-4	30-0	32-0	33-7	35-4	37-1	38-1
	16	17-5	18-7	19-10	21-7	22-5	23-7	24-9	26-1	27-4	29-9	31-1
	24	11-9	12-7	13-6	14-4	15-2	16-0	16-10	17-8	18-6	20-2	21-1
3 x 14	12	26-5	28-4	30-0	31-7	33-4	35-1	36-8	38-5	40-2	42-0	43-7
	16	20-2	21-8	23-1	24-7	26-0	27-5	28-10	30-0	31-7	33-7	35-4
	24	13-9	14-9	15-8	16-8	17-8	18-8	19-8	20-8	21-7	23-7	24-7
4 x 6	12	15-9	16-10	18-0	19-2	20-4	21-5	22-6	23-8	24-9	27-0	28-2
	16	12-0	12-9	13-8	14-6	15-5	16-2	17-1	18-0	18-9	20-6	21-5
	24	8-1	8-8	9-2	9-9	10-5	11-0	11-6	12-1	12-8	13-9	14-5
4 x 8	12	20-8	22-1	23-7	25-1	26-7	28-0	29-6	30-0	31-7	33-7	35-4
	16	15-9	16-10	18-0	19-1	20-4	21-5	22-6	23-7	24-9	27-0	28-1
	24	10-8	11-5	12-2	13-0	13-8	14-6	15-2	16-0	16-9	18-4	19-1
4 x 10	12	25-8	27-7	29-5	30-0	31-7	33-4	35-1	36-8	38-5	40-2	42-0
	16	19-8	21-1	22-6	23-10	25-4	26-8	28-1	29-7	30-0	33-0	34-10
	24	13-5	14-5	15-4	16-4	17-2	18-2	19-1	20-1	21-1	23-0	23-10

NOTE.—The lengths are based on:
Allowable horizontal shear stress as noted for "S."
Dead load.—Weight of joist.
Weight of lath and plaster ceiling (10 pounds per square foot).
Double thickness of flooring (5 pounds per square foot).
Live load.—100 pounds per square foot of floor area with plastered ceiling, or
110 pounds per square foot with ceiling unplastered.

FLOOR JOIST SPANS (125 Pound Load)

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED													
Live Load 125 Pounds per Square Foot with Plastered Ceiling. Live Load 135 Pounds per Square Foot with Unplastered Ceiling.													
MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)													
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Spans Limited by Horizontal Shear (Read Carefully)											
		Having determined by reference to the building code or the table on page 1 the horizontal shear stress in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine the span limited by the horizontal shear stress. THEN refer to the tables on page 14 and in the same manner determine the span of the joist limited by its bending strength and use the shorter of the two spans.											
		S=70	S=75	S=80	S=85	S=90	S=95	S=100	S=105	S=110	S=120	S=125	
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	
2 x 8	12	7-10	8-6	9-1	9-7	10-2	10-9	11-4	11-10	12-6	13-7	14-2	
	16	6-0	6-5	6-9	7-4	7-8	8-1	8-7	9-0	9-5	10-4	10-8	
2 x 10	12	10-0	10-8	11-5	12-1	12-9	13-7	14-4	15-0	15-8	17-1	17-9	
	16	7-6	8-1	8-7	9-2	9-8	10-2	10-9	11-4	11-10	12-10	13-6	
2 x 12	12	12-0	12-10	13-8	14-7	15-5	16-4	17-2	18-0	18-10	20-7	21-6	
	16	9-1	9-8	10-5	11-0	11-8	12-4	13-0	13-7	14-4	15-7	16-2	
2 x 14	12	14-0	15-0	16-0	17-0	18-0	19-0	20-0	21-0	22-0	24-0	25-0	
	16	10-7	11-5	12-1	12-10	13-7	14-5	15-1	15-10	16-8	18-2	18-10	
	24	7-1	7-8	8-2	8-8	9-2	9-8	10-2	10-8	11-2	12-2	12-9	
3 x 6	12	9-7	10-2	10-10	11-7	12-4	13-0	13-8	14-4	15-0	16-5	17-1	
	16	7-2	7-8	8-4	8-9	9-4	9-9	10-4	10-9	11-5	12-5	12-10	
3 x 8	12	12-7	13-6	14-5	15-4	16-2	17-1	18-0	18-10	19-9	21-7	22-6	
	16	9-7	10-2	10-10	11-7	12-4	13-0	13-8	14-4	15-0	16-5	17-1	
	24	6-5	6-10	7-5	7-9	8-4	8-8	9-2	9-7	10-1	11-0	11-6	
3 x 10	12	15-9	16-10	18-1	19-2	20-4	21-6	22-7	23-8	24-9	27-1	28-2	
	16	12-0	12-10	13-8	14-7	15-5	16-4	17-2	18-0	18-10	20-7	21-5	
	24	8-1	8-8	9-4	9-9	10-5	11-0	11-7	12-2	12-8	13-10	14-6	
3 x 12	12	18-10	20-4	21-7	23-0	24-5	25-8	27-1	28-5	29-9	30-0	30-0	
	16	14-5	15-6	16-6	17-6	18-6	19-7	20-7	21-7	22-8	24-8	25-9	
	24	9-9	10-6	11-2	11-10	12-6	13-2	13-10	14-7	15-4	16-8	17-5	
3 x 14	12	22-0	23-7	25-2	26-8	28-4	29-10	30-0	30-0	30-0	30-0	30-0	
	16	16-9	18-0	19-2	20-5	21-7	22-9	24-0	25-2	26-5	28-9	30-4	
	24	11-5	12-2	13-0	13-9	14-8	15-6	16-4	17-1	17-10	19-6	20-4	
4 x 6	12	13-1	14-0	14-10	15-10	16-9	17-8	18-8	19-7	20-6	22-5	23-4	
	16	9-10	10-7	11-4	12-0	12-8	13-5	14-1	14-9	15-7	17-0	17-8	
	24	6-8	7-1	7-7	8-1	8-7	9-0	9-6	10-0	10-6	11-5	11-10	
4 x 8	12	17-2	18-5	19-7	20-10	22-1	23-4	24-6	25-9	27-0	29-5	30-0	
	16	13-1	14-0	14-10	15-10	16-9	17-8	18-7	19-7	20-6	22-5	23-4	
	24	8-9	9-5	10-1	10-8	11-4	12-0	12-7	13-2	13-10	15-1	15-8	
4 x 10	12	21-5	23-0	24-6	26-0	27-7	29-1	30-0	30-0	30-0	30-0	30-0	
	16	16-4	17-6	18-8	19-9	21-0	22-2	23-4	24-6	25-8	28-0	29-2	
	24	11-1	11-10	12-8	13-6	14-4	15-0	15-9	16-7	17-5	19-0	19-9	

NOTE.—The lengths are based on:
Allowable horizontal shear stress as noted for "S."
Dead load.—Weight of joist.
Weight of lath and plaster ceiling (10 pounds per square foot).
Double thickness of flooring (5 pounds per square foot).
Live load.—125 pounds per square foot of floor area with plastered ceiling, or
135 pounds per square foot with ceiling unplastered.

FLOOR JOIST SPANS (150 Pound Load)

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED		MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)													
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	Spans Determined by Bending (Read Carefully)													
		Having determined by reference to the building code or the table on page 1 the allowable stress in bending in pounds per square inch for the species and grade of timber used, refer to the column below with the corresponding value to determine the span limited by the bending strength of the joist. THEN refer to the table on page 17 and in the same manner determine the span of the joist limited by horizontal shear and use the shorter of the two spans.													
		E=1,000,000	E=1,200,000	E=1,400,000	E=1,600,000	f=900	f=1,000	f=1,100	f=1,200	f=1,300	f=1,400	f=1,500	f=1,600	f=1,700	f=1,800
2 x 8	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		7-10 7-2	8-5 7-7	8-9 8-0	9-2 8-5	7-4 6-5	7-8 6-8	8-1 7-0	8-5 7-4	8-9 7-7	9-1 7-10	9-5 8-2	9-8 8-6	10-1 8-8	10-4 9-0
2 x 10	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		10-0 9-1	10-7 9-8	11-2 10-2	11-8 10-8	9-4 8-0	9-8 8-6	10-2 8-10	10-8 9-4	11-1 9-7	11-7 10-0	12-0 10-5	12-5 10-8	12-9 11-0	13-1 11-5
2 x 12	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		12-1 11-0	12-10 11-8	13-6 12-4	14-2 12-10	11-2 9-8	11-9 10-2	12-5 10-9	12-10 11-2	13-5 11-8	13-10 12-2	14-5 12-7	15-0 13-0	15-5 13-5	15-10 13-9
2 x 14	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		14-3 13-0	15-1 13-10	15-11 14-6	16-7 15-7	13-3 11-5	13-11 12-0	14-6 12-7	15-3 13-3	15-10 13-9	16-5 14-3	16-11 14-10	17-6 15-3	18-1 15-9	18-7 16-3
3 x 6	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		7-0 6-4	7-5 6-9	7-10 7-1	8-3 7-6	7-0 6-1	7-5 6-5	7-9 6-9	8-1 7-0	8-5 7-4	8-9 7-7	9-1 7-11	9-4 8-1	9-7 8-5	9-11 8-7
3 x 8	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		9-4 8-5	9-11 9-0	10-5 9-6	10-11 9-11	9-4 8-1	9-10 8-6	10-4 8-11	10-9 9-4	11-4 9-10	11-7 10-1	12-0 10-5	12-5 10-10	12-10 11-1	13-3 11-5
3 x 10	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		11-9 10-9	12-6 11-5	13-1 12-0	13-9 12-6	11-9 10-3	12-5 10-10	13-0 11-4	13-6 11-10	14-1 12-4	14-7 12-9	15-1 13-3	15-9 13-7	16-1 14-0	16-7 14-6
3 x 12	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		14-3 12-11	15-0 13-9	15-10 14-6	16-7 15-1	14-1 12-4	14-11 13-0	15-7 13-7	16-4 14-3	17-0 14-10	17-7 15-5	18-3 15-11	18-10 16-5	19-5 16-11	20-0 17-5
3 x 14	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		16-7 15-1	17-7 16-1	18-6 16-11	19-5 17-9	16-6 14-5	17-5 15-3	18-4 15-11	19-1 16-7	19-10 17-4	20-7 18-0	21-4 18-7	22-0 19-3	22-9 19-10	23-5 20-5
4 x 6	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		13-4 11-4	14-1 12-0	14-11 12-9	15-6 13-4	10-1 8-5	10-9 8-10	11-3 9-4	11-9 9-9	12-3 10-0	12-7 10-5	13-1 10-10	13-6 11-3	13-11 11-6	14-4 11-10
4 x 8	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		17-10 16-3	18-3 16-7	18-9 16-11	19-1 17-9	8-3 7-1	8-9 7-6	9-1 7-11	9-6 8-3	9-10 7-0	10-3 8-11	10-7 9-3	10-11 9-6	11-4 9-10	11-7 10-1
4 x 10	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		10-4 9-5	10-11 10-0	11-6 10-6	12-0 11-0	10-11 9-6	11-5 10-0	12-0 10-6	12-7 10-11	13-1 11-5	13-7 11-10	14-0 12-3	14-6 12-7	14-11 13-0	15-5 13-5
4 x 12	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
		13-0 11-11	13-10 12-7	14-6 13-4	15-3 13-11	13-9 11-11	14-5 12-7	15-1 13-3	15-10 13-10	16-6 14-5	17-1 14-11	17-9 15-5	18-3 15-11	18-10 16-5	19-5 16-11

NOTE.—The lengths are based on:
When limited by deflection—Maximum allowable deflection of 1/360 of span length.
When determined by bending strength of the piece—Allowable stress in extreme fibre in bending as noted for “f.”
Dead load—Weight of joist.
Weight of lath and plaster ceiling (10 pounds per square foot).
Double thickness of flooring (5 pounds per square foot).
Live load—150 pounds per square foot of floor area with plastered ceiling, or 160 pounds per square foot with ceiling unplastered.

FLOOR JOIST SPANS (150 Pound Load)

MAXIMUM SPANS FOR FLOOR JOISTS—UNIFORMLY LOADED
Live Load 150 Pounds per Square Foot with Plastered Ceiling. Live Load 160 Pounds per Square Foot with Unplastered Ceiling.

MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)												
Spans Limited by Horizontal Shear (Read Carefully)												
Having determined by reference to the building code or the table on page 1 the horizontal shear stress in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine the span limited by the horizontal shear stress. THEN refer to the tables on page 16 and in the same manner determine the span of the joist limited by its bending strength and use the shorter of the two spans.												
Size of Joists (Nominal) in Inches	Spacing of Joists Center to Center in Inches	S=70	S=75	S=80	S=85	S=90	S=95	S=100	S=105	S=110	S=120	S=125
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
2 x 8	12	6-9	7-2	7-8	8-2	8-8	9-2	9-8	10-1	10-7	11-7	12-1
	16	5-1	5-6	5-9	6-2	6-6	6-10	7-4	7-7	8-0	8-8	9-1
2 x 10	12	8-6	9-1	9-8	10-4	10-10	11-7	12-2	12-9	13-5	14-7	15-2
	16	6-5	6-10	7-4	7-9	8-4	8-8	9-2	9-7	10-1	11-0	11-6
2 x 12	12	10-2	11-0	11-8	12-5	13-2	13-10	14-7	15-5	16-1	17-7	18-4
	16	7-8	8-4	8-10	9-5	10-0	10-6	11-1	11-7	12-2	13-4	13-9
2 x 14	12	11-10	12-9	13-7	14-6	15-4	16-2	17-0	17-10	18-9	20-6	21-4
	16	9-0	9-8	10-4	11-0	11-7	12-4	12-10	13-7	14-2	15-6	16-1
3 x 6	12	8-1	8-8	9-4	9-10	10-6	11-1	11-7	12-2	12-9	14-0	14-7
	16	6-2	6-7	7-0	7-6	7-10	8-4	8-9	9-2	9-8	10-6	11-0
3 x 8	12	10-9	11-6	12-4	13-1	13-9	14-7	15-5	16-2	16-10	18-6	19-2
	16	8-1	8-8	9-4	9-10	10-6	11-0	11-7	12-2	12-9	14-0	14-6
3 x 10	12	13-6	14-6	15-5	16-5	17-5	18-4	19-4	20-4	21-2	23-2	24-1
	16	10-2	11-0	11-8	12-5	13-2	13-10	14-7	15-5	16-1	17-7	18-4
3 x 12	24	6-10	7-5	7-10	8-5	8-10	9-5	9-10	10-5	10-9	11-9	12-4
	12	16-2	17-5	18-6	19-8	20-10	22-0	23-2	24-4	25-6	27-9	29-0
3 x 14	16	12-4	13-2	14-1	15-0	15-9	16-8	17-7	18-6	19-5	21-1	22-0
	24	8-4	8-10	9-6	10-1	10-8	11-4	11-10	12-6	13-1	14-4	14-10
4 x 6	12	18-10	20-2	21-7	22-10	24-4	25-7	27-0	28-4	29-8	30-0	31-8
	16	14-5	15-5	16-5	17-5	18-6	19-6	20-6	21-6	22-7	24-7	25-8
4 x 8	24	9-8	10-5	11-1	11-9	12-6	13-2	13-10	14-7	15-4	16-8	17-5
	12	11-2	11-10	12-8	13-6	14-4	15-1	15-10	16-8	17-6	19-1	19-10
4 x 10	16	8-5	9-0	9-7	10-2	10-9	11-5	12-1	12-8	13-4	14-6	15-1
	24	5-8	6-1	6-6	6-10	7-4	7-8	8-1	8-6	8-10	9-8	10-1
4 x 12	12	14-8	15-8	16-9	17-9	18-10	19-10	21-0	22-0	23-1	25-2	26-2
	16	11-1	11-10	12-8	13-6	14-4	15-1	15-10	16-8	17-6	19-1	19-10
4 x 14	24	7-6	8-0	8-7	9-1	9-8	10-2	10-8	11-4	11-9	12-10	13-5
	12	18-5	19-8	21-0	22-4	23-7	24-10	26-4	27-7	28-10	30-0	31-0
4 x 16	16	14-0	15-0	16-0	17-0	18-0	19-0	20-0	21-0	22-0	24-0	25-0
	24	9-6	10-1	10-9	11-6	12-2	12-9	13-6	14-2	14-10	16-2	16-10

NOTE.—The lengths are based on:
Allowable horizontal shear stress as noted for "S."
Dead load—Weight of joist.
Weight of lath and plaster ceiling (10 pounds per square foot).
Double thickness of flooring (5 pounds per square foot).
Live load—150 pounds per square foot of floor area with plastered ceiling, or
160 pounds per square foot with ceiling unplastered.

CEILING AND ATTIC JOIST SPANS

MAXIMUM SPANS FOR CEILING JOISTS AND ATTIC FLOOR JOISTS—UNIFORMLY LOADED									
MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS (Clear Span)									
Size of Joists (Nominal) in inches	Spacing of Joists Center to Center in Inches	Limited by Deflection of 1/360 of the Span Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine maximum safe span.						ATTIC FLOOR JOISTS—Live Load 20 lbs. per sq. ft.	
		CEILING JOISTS							
		E=1,000,000	E=1,200,000	E=1,400,000	E=1,600,000	E=1,000,000	E=1,200,000	E=1,400,000	E=1,600,000
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
2 x 4	12	9—4	10—0	10—6	11—0	6—6	7—0	7—4	7—8
	16	8—7	9—2	9—8	10—0	5—11	6—3	6—8	6—11
	24	7—7	8—1	8—6	8—11	5—3	5—7	5—10	6—1
2 x 6	12	14—2	15—5	15—10	16—7	10—0	10—9	11—3	11—0
	16	13—3	14—0	14—8	15—4	9—1	9—8	10—2	10—8
	24	11—8	12—5	13—0	13—8	8—1	8—7	9—0	9—7
2 x 8	12	18—6	19—8	20—0	21—8	13—4	14—2	14—11	15—7
	16	17—2	18—3	19—3	20—2	12—1	12—10	13—6	14—2
	24	15—4	16—4	17—2	18—0	10—9	11—5	12—0	12—7
2 x 10	12	23—0	24—5	25—8	26—10	16—9	17—9	18—9	19—7
	16	21—4	22—9	24—0	25—0	15—3	16—2	17—0	17—9
	24	19—3	20—5	21—6	22—6	13—7	14—5	15—2	15—10
2 x 12	12	27—2	28—11	30—0	29—9	20—0	21—4	22—6	23—6
	16	25—6	27—0	28—6	26—10	18—4	19—5	20—6	21—5
	24	23—0	24—5	25—9	26—10	16—4	17—4	18—3	19—1

NOTE.—The lengths are based on:

Maximum allowable deflection of 1/360 of span length.
 Modulus of elasticity as noted for "E."
 Ceiling joists
 Dead load—Weight of joists plus plaster ceiling (10 pounds per square foot).
 Live load—None.

Attic floor joists

Dead load—Weight of joist.

Weight of lath and plaster ceiling (10 pounds per square foot).

Single thickness of flooring (2.5 pounds per square foot).

Live load—20 pounds per square foot of floor area.

RAFTER SPANS (15 Pound Load—Group I Covering)

MAXIMUM SPANS FOR RAFTERS—UNIFORMLY LOADED															
Slope of 20° or more. Live Load 15 Pounds per Square Foot.															
MAXIMUM ALLOWABLE UNSUPPORTED LENGTHS FROM PLATE TO RIDGE (Without Collar Beams)															
Size of Rafters (Nominal) in inches	Spacing of Rafters Center to Center in Inches	Limited by Deflection of 1/360 of the Span				Determined by Bending									
		Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.				Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.									
		E=1,000,000	E=1,200,000	E=1,400,000	E=1,600,000	f=900	f=1,000	f=1,100	f=1,200	f=1,300	f=1,400	f=1,500	f=1,600	f=1,700	f=1,800
2 x 4	12	Ft. Ins. 7-7	Ft. Ins. 8-0	Ft. Ins. 8-6	Ft. Ins. 8-11	Ft. Ins. 9-11	Ft. Ins. 10-4	Ft. Ins. 10-11	Ft. Ins. 11-5	Ft. Ins. 11-11	Ft. Ins. 12-4	Ft. Ins. 12-9	Ft. Ins. 13-2	Ft. Ins. 13-7	Ft. Ins. 14-0
	16	Ft. Ins. 6-11	Ft. Ins. 7-5	Ft. Ins. 7-8	Ft. Ins. 8-1	Ft. Ins. 8-8	Ft. Ins. 9-1	Ft. Ins. 9-6	Ft. Ins. 10-0	Ft. Ins. 10-5	Ft. Ins. 10-9	Ft. Ins. 11-2	Ft. Ins. 11-7	Ft. Ins. 11-10	Ft. Ins. 12-4
	24	Ft. Ins. 6-1	Ft. Ins. 6-6	Ft. Ins. 6-9	Ft. Ins. 7-1	Ft. Ins. 7-1	Ft. Ins. 7-6	Ft. Ins. 7-11	Ft. Ins. 8-2	Ft. Ins. 8-7	Ft. Ins. 8-10	Ft. Ins. 9-2	Ft. Ins. 9-6	Ft. Ins. 9-9	Ft. Ins. 10-1
2 x 6	12	Ft. Ins. 11-7	Ft. Ins. 12-5	Ft. Ins. 13-0	Ft. Ins. 13-7	Ft. Ins. 15-1	Ft. Ins. 15-10	Ft. Ins. 16-8	Ft. Ins. 17-5	Ft. Ins. 18-1	Ft. Ins. 18-9	Ft. Ins. 19-6	Ft. Ins. 20-1	Ft. Ins. 20-8	Ft. Ins. 21-4
	16	Ft. Ins. 10-8	Ft. Ins. 11-4	Ft. Ins. 12-0	Ft. Ins. 12-6	Ft. Ins. 13-2	Ft. Ins. 14-0	Ft. Ins. 14-8	Ft. Ins. 15-4	Ft. Ins. 15-10	Ft. Ins. 16-6	Ft. Ins. 17-1	Ft. Ins. 17-8	Ft. Ins. 18-2	Ft. Ins. 18-9
	24	Ft. Ins. 9-5	Ft. Ins. 10-0	Ft. Ins. 10-6	Ft. Ins. 11-0	Ft. Ins. 11-0	Ft. Ins. 11-7	Ft. Ins. 12-2	Ft. Ins. 12-8	Ft. Ins. 13-2	Ft. Ins. 13-8	Ft. Ins. 14-2	Ft. Ins. 14-7	Ft. Ins. 15-1	Ft. Ins. 15-6
2 x 8	12	Ft. Ins. 15-4	Ft. Ins. 16-4	Ft. Ins. 17-1	Ft. Ins. 17-10	Ft. Ins. 19-8	Ft. Ins. 20-9	Ft. Ins. 21-9	Ft. Ins. 22-9	Ft. Ins. 23-8	Ft. Ins. 24-7	Ft. Ins. 25-6	Ft. Ins. 26-4	Ft. Ins. 27-1	Ft. Ins. 27-10
	16	Ft. Ins. 14-1	Ft. Ins. 15-0	Ft. Ins. 15-9	Ft. Ins. 16-6	Ft. Ins. 17-5	Ft. Ins. 18-5	Ft. Ins. 19-4	Ft. Ins. 20-1	Ft. Ins. 20-10	Ft. Ins. 21-8	Ft. Ins. 22-6	Ft. Ins. 23-4	Ft. Ins. 24-0	Ft. Ins. 24-7
	24	Ft. Ins. 12-6	Ft. Ins. 13-2	Ft. Ins. 13-10	Ft. Ins. 14-7	Ft. Ins. 14-6	Ft. Ins. 15-4	Ft. Ins. 16-0	Ft. Ins. 16-8	Ft. Ins. 17-5	Ft. Ins. 18-0	Ft. Ins. 18-8	Ft. Ins. 19-4	Ft. Ins. 19-10	Ft. Ins. 20-6
2 x 10	12	Ft. Ins. 19-2	Ft. Ins. 20-5	Ft. Ins. 21-6	Ft. Ins. 22-5	Ft. Ins. 24-6	Ft. Ins. 25-10	Ft. Ins. 27-1	Ft. Ins. 28-4	Ft. Ins. 29-6	Ft. Ins. 30-0	Ft. Ins. 31-1	Ft. Ins. 32-0	Ft. Ins. 33-0	Ft. Ins. 34-0
	16	Ft. Ins. 17-8	Ft. Ins. 18-9	Ft. Ins. 19-9	Ft. Ins. 20-8	Ft. Ins. 21-9	Ft. Ins. 22-10	Ft. Ins. 24-0	Ft. Ins. 25-1	Ft. Ins. 26-1	Ft. Ins. 27-1	Ft. Ins. 28-1	Ft. Ins. 29-0	Ft. Ins. 30-0	Ft. Ins. 31-0
	24	Ft. Ins. 15-8	Ft. Ins. 16-8	Ft. Ins. 17-6	Ft. Ins. 18-4	Ft. Ins. 18-2	Ft. Ins. 19-1	Ft. Ins. 20-1	Ft. Ins. 21-0	Ft. Ins. 21-9	Ft. Ins. 22-7	Ft. Ins. 23-5	Ft. Ins. 24-2	Ft. Ins. 25-0	Ft. Ins. 25-8
2 x 12	12	Ft. Ins. 22-10	Ft. Ins. 24-5	Ft. Ins. 25-7	Ft. Ins. 26-9	Ft. Ins. 29-2	Ft. Ins. 30-0	Ft. Ins. 31-8	Ft. Ins. 33-0	Ft. Ins. 34-2	Ft. Ins. 35-2	Ft. Ins. 36-1	Ft. Ins. 37-0	Ft. Ins. 38-0	Ft. Ins. 39-0
	16	Ft. Ins. 21-2	Ft. Ins. 22-6	Ft. Ins. 23-8	Ft. Ins. 24-9	Ft. Ins. 26-0	Ft. Ins. 27-5	Ft. Ins. 28-8	Ft. Ins. 30-0	Ft. Ins. 31-1	Ft. Ins. 32-2	Ft. Ins. 33-1	Ft. Ins. 34-0	Ft. Ins. 35-0	Ft. Ins. 36-0
	24	Ft. Ins. 18-10	Ft. Ins. 20-0	Ft. Ins. 21-1	Ft. Ins. 22-1	Ft. Ins. 21-9	Ft. Ins. 23-0	Ft. Ins. 24-1	Ft. Ins. 25-1	Ft. Ins. 26-2	Ft. Ins. 27-2	Ft. Ins. 28-1	Ft. Ins. 29-0	Ft. Ins. 30-0	Ft. Ins. 31-0
2 x 14	12	Ft. Ins. 26-6	Ft. Ins. 28-1	Ft. Ins. 29-9	Ft. Ins. 30-0	Ft. Ins. 31-11	Ft. Ins. 32-7	Ft. Ins. 34-11	Ft. Ins. 35-5	Ft. Ins. 36-0	Ft. Ins. 37-0	Ft. Ins. 38-0	Ft. Ins. 39-0	Ft. Ins. 40-0	Ft. Ins. 41-0
	16	Ft. Ins. 24-7	Ft. Ins. 26-3	Ft. Ins. 27-6	Ft. Ins. 28-10	Ft. Ins. 29-11	Ft. Ins. 30-7	Ft. Ins. 32-11	Ft. Ins. 33-5	Ft. Ins. 34-0	Ft. Ins. 35-0	Ft. Ins. 36-0	Ft. Ins. 37-0	Ft. Ins. 38-0	Ft. Ins. 39-0
	24	Ft. Ins. 22-0	Ft. Ins. 23-5	Ft. Ins. 24-7	Ft. Ins. 25-9	Ft. Ins. 25-3	Ft. Ins. 26-7	Ft. Ins. 27-11	Ft. Ins. 29-1	Ft. Ins. 30-0	Ft. Ins. 31-0	Ft. Ins. 32-0	Ft. Ins. 33-0	Ft. Ins. 34-0	Ft. Ins. 35-0
3 x 6	12	Ft. Ins. 13-5	Ft. Ins. 14-3	Ft. Ins. 14-11	Ft. Ins. 15-7	Ft. Ins. 18-6	Ft. Ins. 19-6	Ft. Ins. 20-6	Ft. Ins. 21-5	Ft. Ins. 22-4	Ft. Ins. 23-1	Ft. Ins. 23-11	Ft. Ins. 24-9	Ft. Ins. 25-6	Ft. Ins. 26-3
	16	Ft. Ins. 12-4	Ft. Ins. 13-1	Ft. Ins. 13-10	Ft. Ins. 14-5	Ft. Ins. 16-5	Ft. Ins. 17-4	Ft. Ins. 18-3	Ft. Ins. 18-11	Ft. Ins. 19-9	Ft. Ins. 20-6	Ft. Ins. 21-3	Ft. Ins. 21-11	Ft. Ins. 22-7	Ft. Ins. 23-3
	24	Ft. Ins. 10-11	Ft. Ins. 11-7	Ft. Ins. 12-3	Ft. Ins. 12-10	Ft. Ins. 13-9	Ft. Ins. 14-6	Ft. Ins. 15-3	Ft. Ins. 15-10	Ft. Ins. 16-6	Ft. Ins. 17-1	Ft. Ins. 17-9	Ft. Ins. 18-4	Ft. Ins. 18-10	Ft. Ins. 19-5
3 x 8	12	Ft. Ins. 17-6	Ft. Ins. 18-7	Ft. Ins. 19-6	Ft. Ins. 20-5	Ft. Ins. 24-0	Ft. Ins. 25-4	Ft. Ins. 26-6	Ft. Ins. 27-9	Ft. Ins. 29-0	Ft. Ins. 30-0	Ft. Ins. 31-7	Ft. Ins. 32-6	Ft. Ins. 33-5	Ft. Ins. 34-5
	16	Ft. Ins. 16-3	Ft. Ins. 17-3	Ft. Ins. 18-1	Ft. Ins. 18-11	Ft. Ins. 21-5	Ft. Ins. 22-6	Ft. Ins. 23-7	Ft. Ins. 24-9	Ft. Ins. 25-11	Ft. Ins. 26-9	Ft. Ins. 27-7	Ft. Ins. 28-6	Ft. Ins. 29-5	Ft. Ins. 30-0
	24	Ft. Ins. 14-5	Ft. Ins. 15-4	Ft. Ins. 16-1	Ft. Ins. 16-10	Ft. Ins. 18-0	Ft. Ins. 18-11	Ft. Ins. 19-11	Ft. Ins. 20-10	Ft. Ins. 21-9	Ft. Ins. 22-5	Ft. Ins. 23-3	Ft. Ins. 24-0	Ft. Ins. 24-9	Ft. Ins. 25-5
3 x 10	12	Ft. Ins. 21-9	Ft. Ins. 23-1	Ft. Ins. 24-4	Ft. Ins. 25-5	Ft. Ins. 29-6	Ft. Ins. 30-0	Ft. Ins. 31-4	Ft. Ins. 32-0	Ft. Ins. 33-11	Ft. Ins. 34-11	Ft. Ins. 35-11	Ft. Ins. 36-0	Ft. Ins. 37-0	Ft. Ins. 38-0
	16	Ft. Ins. 20-3	Ft. Ins. 21-5	Ft. Ins. 22-7	Ft. Ins. 23-7	Ft. Ins. 26-6	Ft. Ins. 27-11	Ft. Ins. 28-10	Ft. Ins. 29-11	Ft. Ins. 30-0	Ft. Ins. 31-0	Ft. Ins. 32-0	Ft. Ins. 33-0	Ft. Ins. 34-0	Ft. Ins. 35-0
	24	Ft. Ins. 18-0	Ft. Ins. 19-3	Ft. Ins. 20-3	Ft. Ins. 21-1	Ft. Ins. 22-5	Ft. Ins. 23-7	Ft. Ins. 24-10	Ft. Ins. 25-11	Ft. Ins. 26-11	Ft. Ins. 27-11	Ft. Ins. 28-11	Ft. Ins. 30-0	Ft. Ins. 31-0	Ft. Ins. 32-0

NOTE—The lengths are based on:
When limited by deflection—
Maximum allowable deflection of 1/360 of span length.
Modulus of elasticity as noted for “E.”
When determined by bending strength of the piece—
Allowable stress in extreme fibre in bending as noted for “f.”

Dead load—Weight of roof joist.
Weight of roof sheathing (2.5 pounds per square foot).
Weight of roof coverings (2.5 pounds per square foot). (Group I.)
Live load—15 pounds per square foot of roof surface considered as acting normal to the surface.

NOTE—The lengths are based on:

When limited by deflection—

Maximum allowable deflection of 1/360 of span length.

Modulus of elasticity as noted for "E."

When determined by bending strength of the piece—

Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of roof joist.

Weight of roof sheathing (2.5 pounds per square foot).

Weight of roof coverings (2.5 pounds per square foot). (Group I.)

Live load—15 pounds per square foot of roof surface considered as acting normal to the surface.

RAFTER SPANS (20 Pound Load—Group I Covering)

MAXIMUM SPANS FOR RAFTERS—UNIFORMLY LOADED																					
Slope of 20° or more. Live Load 20 Pounds per Square Foot.																					
MAXIMUM ALLOWABLE UNSUPPORTED LENGTHS FROM PLATE TO RIDGE (Without Collar Beams)																					
Size of Rafters (Nominal) in Inches	Spacing of Rafters Center to Center in Inches	Limited by Deflection of 1/360 of the Span					Determined by Bending														
		Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.										Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.									
		E=1,000,000	E=1,200,000	E=1,400,000	E=1,600,000	E=1,800,000	f=900	f=1,000	f=1,100	f=1,200	f=1,300	f=1,400	f=1,500	f=1,600	f=1,700	f=1,800					
2 x 4	12	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.					
	16	7—1	7—6	7—10	8—4	8—10	9—5	9—9	10—4	10—8	11—1	11—6	11—10	12—3	12—8	12—12					
	24	6—6	6—9	7—2	7—6	7—9	8—4	8—7	9—0	9—4	9—7	10—1	10—5	10—8	11—0	11—4					
2 x 6	12	5—7	6—0	6—4	6—7	6—5	6—8	7—0	7—5	7—8	8—0	8—4	8—6	8—9	9—1	9—5					
	16	10—9	11—6	13—5	12—8	13—7	14—5	15—0	15—8	16—5	17—0	17—7	18—1	18—8	19—2	19—6					
	24	9—10	10—7	11—1	11—7	11—10	12—7	13—2	13—9	14—5	14—9	15—5	15—10	16—5	16—10	16—14					
2 x 8	12	8—8	9—8	9—10	10—4	9—9	10—2	10—10	11—5	11—10	12—3	12—8	13—1	13—7	14—0	14—4					
	16	14—4	15—2	16—1	16—9	17—10	18—10	19—9	20—8	21—6	22—3	23—1	23—10	24—7	25—4	25—8					
	24	13—2	14—0	14—8	15—5	15—8	16—7	17—5	18—2	18—10	19—6	20—4	21—0	21—8	22—4	22—8					
2 x 10	12	11—7	12—4	13—0	13—7	13—0	13—8	14—5	15—1	15—8	16—3	16—9	17—5	17—10	18—5	18—9					
	16	18—0	19—1	20—1	21—0	22—4	23—6	24—8	25—9	26—9	27—8	28—9	29—8	30—0	30—4	30—8					
	24	16—7	17—7	18—6	19—5	19—8	20—9	21—9	22—9	23—8	24—6	25—6	26—4	27—1	27—10	27—14					
2 x 12	12	14—7	15—7	16—5	17—1	16—5	17—4	18—1	18—10	19—8	20—5	21—2	21—10	22—6	23—2	23—6					
	16	21—7	22—10	24—1	25—2	26—7	28—1	29—6	30—0	28—5	29—5	30—0	26—4	27—1	27—10	27—14					
	24	19—10	21—1	22—4	23—4	23—7	24—10	26—1	27—2	23—8	24—6	25—6	26—4	27—1	27—10	27—14					
2 x 14	12	17—7	18—8	19—8	20—7	19—8	20—9	21—9	22—8	23—8	24—6	25—5	26—4	27—1	27—10	27—14					
	16	25—0	26—7	28—0	29—4	30—0	28—10	30—0	26—5	27—6	28—6	29—7	30—0	26—4	27—10	27—14					
	24	23—3	24—7	25—11	27—1	27—4	28—1	25—4	26—5	23—8	24—6	25—5	26—4	27—1	27—10	27—14					
3 x 6	12	20—7	21—11	23—1	24—1	23—1	24—1	21—9	22—8	23—8	24—6	25—5	26—4	27—1	27—10	27—14					
	16	25—0	26—7	28—0	29—4	30—0	28—10	30—0	26—5	27—6	28—6	29—7	30—0	26—4	27—10	27—14					
	24	23—3	24—7	25—11	27—1	27—4	28—1	25—4	26—5	23—8	24—6	25—5	26—4	27—1	27—10	27—14					
3 x 8	12	12—6	13—4	14—0	14—9	16—11	17—10	18—9	19—6	20—4	21—0	21—10	22—6	23—3	23—11	23—15					
	16	11—6	12—4	12—11	13—6	14—11	15—9	16—6	17—3	17—10	18—6	19—3	19—10	20—5	21—0	21—4					
	24	10—3	10—10	11—5	11—11	12—5	13—0	13—9	14—4	14—11	15—5	16—0	16—6	17—0	17—6	17—10					
3 x 10	12	16—5	17—6	18—5	19—3	21—11	23—1	24—3	25—4	26—6	27—4	28—4	29—3	30—0	30—4	30—8					
	16	15—3	16—3	17—0	17—10	19—5	20—6	21—6	22—6	23—6	24—4	25—1	25—11	26—9	27—6	27—10					
	24	13—6	14—4	15—1	15—10	16—4	17—1	18—0	18—10	19—9	20—4	21—0	21—9	22—5	23—0	23—4					
3 x 12	12	20—6	21—10	22—11	24—0	27—1	28—7	30—0													
	16	19—0	20—3	21—4	22—3	24—3	25—6	26—9	27—11	29—1	30—0										
	24	16—11	18—0	18—11	19—10	20—4	21—5	22—6	23—6	24—6	25—5	26—4	27—1	28—0	28—10	28—14					

NOTE.—The lengths are based on:

- When limited by deflection—Maximum allowable deflection of 1/360 of span length.
- When determined by bending strength of the piece—Allowable stress in extreme fibre in bending as noted for “f.”

Dead load—Weight of roof joist.
Weight of roof sheathing (2.5 pounds per square foot).
Weight of roof coverings (2.5 pounds per square foot). (Group I.)
Live load—20 pounds per square foot of roof surface considered as acting normal to the surface.

NOTE.—The lengths are based on:

When limited by deflection—

Maximum allowable deflection of 1/360 of span length.

Modulus of elasticity as noted for "E."

When determined by bending strength of the piece—

Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of roof joist.

Weight of roof sheathing (2.5 pounds per square foot).

Weight of roof coverings (2.5 pounds per square foot). (Group I.)

Live load—20 pounds per square foot of roof surface considered as acting normal to the surface.

RAFTER SPANS (30 Pound Load—Group I Covering)

MAXIMUM SPANS FOR RAFTERS—UNIFORMLY LOADED											
Slope of 20° or more. Live Load 30 Pounds per Square Foot											
Size of Rafters (Nominal) in Inches	Spacing of Rafters Center to Center in Inches	MAXIMUM ALLOWABLE UNSUPPORTED LENGTHS FROM PLATE TO RIDGE (Without Collar Beams)									
		Limited by Deflection of 1/360 of the Span					Determined by Bending				
		Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.					Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.				
		E=1,000,000		E=1,200,000		E=1,400,000		E=1,600,000		f=900	
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
2 x 4	12	6—5	6—9	7—2	7—6	8—0	8—5	9—2	9—7	10—2	10—5
	16	5—10	6—2	6—6	6—10	7—0	7—4	7—11	8—3	8—10	9—1
	24	5—1	5—5	5—8	6—0	5—9	6—0	6—7	6—10	7—3	7—6
2 x 6	12	9—10	10—5	11—0	11—6	12—4	12—11	14—0	14—6	15—7	16—1
	16	9—0	9—7	10—1	10—6	10—9	11—3	12—3	12—9	13—8	14—0
	24	7—11	8—5	8—10	9—3	8—10	9—3	10—1	10—6	11—2	11—6
2 x 8	12	13—1	13—10	14—7	15—3	16—3	17—0	18—6	19—2	20—7	21—2
	16	11—11	12—9	13—4	14—0	14—3	15—0	16—3	16—10	17—5	18—7
	24	10—6	11—2	11—9	12—3	11—9	12—4	13—4	13—10	14—5	15—4
2 x 10	12	16—4	17—5	18—4	19—2	20—4	21—4	23—3	24—1	25—9	26—6
	16	15—0	15—11	16—10	17—6	17—11	18—9	20—5	21—2	22—8	23—4
	24	13—4	14—0	14—10	15—6	14—10	15—6	16—11	17—6	18—8	19—3
2 x 12	12	19—8	20—11	22—0	23—0	24—5	25—7	27—9	28—10	30—0	30—0
	16	18—1	19—3	20—3	21—2	21—6	22—6	24—6	25—4	27—2	27—2
	24	15—11	17—0	17—10	18—8	17—10	18—8	20—3	21—1	22—6	23—3
2 x 14	12	22—10	24—4	25—6	26—9	28—3	29—6	30—0	30—0	30—0	30—0
	16	21—3	22—6	23—9	24—10	25—1	26—5	27—6	28—9	29—5	30—0
	24	18—7	19—10	20—10	21—10	20—9	21—9	23—7	24—6	25—5	26—3
3 x 6	12	11—5	12—1	12—9	13—4	14—7	16—1	17—6	18—3	19—5	20—0
	16	10—5	11—1	11—9	12—3	13—6	14—1	15—5	16—11	17—5	18—1
	24	9—3	9—10	10—4	10—10	11—1	11—9	12—9	13—3	14—1	14—6
3 x 8	12	15—0	15—11	16—10	17—6	18—9	20—0	21—4	23—9	25—5	26—3
	16	13—10	14—7	15—5	16—1	17—9	18—7	20—4	21—0	22—5	23—1
	24	12—3	12—11	13—7	14—3	14—9	15—5	16—11	17—5	18—7	19—3
3 x 10	12	18—9	20—0	21—0	21—11	22—1	23—3	25—3	26—6	28—0	28—0
	16	17—4	18—4	19—4	20—3	21—1	22—3	23—3	24—3	25—3	26—1
	24	15—4	16—4	17—1	17—11	18—6	19—5	21—0	21—10	22—7	23—4
NOTE.—The lengths are based on: When limited by deflection— Maximum allowable deflection of 1/360 of span length. Modulus of elasticity as noted for "E." When determined by bending strength of the piece— Allowable stress in extreme fibre in bending as noted for "f."											
Dead load—Weight of roof joist. Weight of roof sheathing (2.5 pounds per square foot). Weight of roof coverings (2.5 pounds per square foot). (Group I.) Live load—30 pounds per square foot of roof surface considered as acting normal to the surface.											

RAFTER SPANS (40 Pound Load—Group I Covering)

MAXIMUM SPANS FOR RAFTERS—UNIFORMLY LOADED																
Slope of 20° or more. Live Load 40 Pounds per Square Foot.																
MAXIMUM ALLOWABLE UNSUPPORTED LENGTHS FROM PLATE TO RIDGE (Without Collar Beams)																
Size of Rafters (Nominal) in Inches	Spacing of Rafters Center to Center in Inches	Limited by Deflection of 1/360 of the Span					Determined by Bending									
		Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.					Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.									
		E=1,000,000	E=1,200,000	E=1,400,000	E=1,600,000	E=1,800,000	f=900	f=1,000	f=1,100	f=1,200	f=1,300	f=1,400	f=1,500	f=1,600	f=1,700	f=1,800
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
2 x 4	12	5-9	6-2	6-6	6-9	7-1	6-8	7-1	7-5	7-9	8-1	8-5	8-8	9-0	9-2	9-6
	16	5-4	5-8	6-0	6-2	6-1	5-10	6-1	6-5	6-8	7-0	7-4	7-7	7-9	8-0	8-4
	24	4-8	5-0	5-2	5-5	5-0	4-9	5-0	5-2	5-6	5-9	6-0	6-2	6-5	6-7	6-9
2 x 6	12	9-0	9-7	10-1	10-7	10-10	10-2	10-10	11-5	12-0	12-5	12-10	13-5	13-9	14-2	14-7
	16	8-2	8-9	8-10	9-8	9-6	9-0	9-6	10-0	10-5	10-10	11-4	11-8	12-0	12-5	12-9
	24	7-2	7-8	8-1	8-6	7-9	7-5	7-9	8-2	8-7	8-10	9-3	9-7	9-10	10-2	10-6
2 x 8	12	12-0	12-9	13-5	14-0	14-7	13-8	14-5	15-1	15-9	16-6	17-1	17-8	18-4	18-9	19-5
	16	11-0	11-8	12-4	12-9	12-7	12-0	12-7	13-2	13-9	14-5	14-10	15-5	16-0	16-5	16-10
	24	9-7	10-2	10-9	11-4	10-5	9-10	10-5	10-10	11-5	11-9	12-4	12-8	13-1	13-7	14-0
2 x 10	12	15-1	16-1	16-10	17-8	18-1	17-2	18-1	19-0	19-10	20-8	21-6	22-2	23-0	23-8	24-4
	16	13-9	14-8	15-6	16-2	15-10	15-1	15-10	16-8	17-5	18-1	18-9	19-5	20-1	20-8	21-4
	24	12-2	12-10	13-7	14-2	13-1	12-5	13-1	13-8	14-4	15-0	15-6	16-0	16-7	17-1	17-7
2 x 12	12	18-2	19-4	20-5	21-4	21-9	20-7	21-9	22-9	23-9	24-9	25-8	26-8	27-6	28-5	29-2
	16	16-8	17-8	18-8	19-6	19-1	18-1	19-1	20-0	20-10	21-9	22-7	23-5	24-2	24-10	25-7
	24	14-8	15-7	16-5	17-2	15-9	15-0	15-9	16-7	17-4	18-0	18-8	19-4	20-0	20-7	21-2
2 x 14	12	21-3	22-7	23-10	24-10	25-4	24-0	25-4	26-6	27-9	28-10	30-0	30-0	28-1	29-0	29-10
	16	19-6	20-10	21-10	22-10	22-3	21-1	22-3	23-4	24-5	25-5	26-4	27-3	28-5	29-0	29-10
	24	17-3	18-4	19-4	20-1	18-6	17-6	18-6	19-5	20-3	21-0	21-10	22-7	23-5	24-1	24-10
3 x 6	12	10-6	11-3	11-10	12-4	13-9	13-0	13-9	14-5	15-0	15-7	16-3	16-10	17-4	17-11	18-5
	16	9-7	10-4	10-10	11-4	12-0	11-5	12-0	12-7	13-1	13-9	14-3	14-9	15-3	15-7	16-1
	24	8-6	9-0	9-6	9-11	9-11	9-5	9-11	10-5	10-11	11-4	11-9	12-1	12-6	12-11	13-4
3 x 8	12	13-11	14-10	15-7	16-4	17-1	17-1	18-0	18-11	19-9	20-7	21-4	22-0	22-10	23-6	24-1
	16	12-10	13-6	14-4	14-11	15-0	15-0	15-10	16-7	17-4	18-1	18-9	19-4	20-0	20-7	21-3
	24	11-3	12-0	12-7	13-3	13-1	12-5	13-1	13-9	14-5	15-0	15-6	16-0	16-7	17-1	17-6
3 x 10	12	17-6	18-6	19-6	20-5	21-4	21-4	22-5	23-7	24-7	25-7	26-7	27-6	28-5	29-4	30-0
	16	16-1	17-0	17-11	18-10	18-10	18-10	19-10	20-10	21-9	22-7	23-5	24-3	25-0	25-10	26-7
	24	14-3	15-1	15-10	16-7	16-6	15-7	16-6	17-4	18-0	18-10	19-6	20-1	20-10	21-5	22-1

NOTE.—The lengths are based on:—

When limited by deflection—

Maximum allowable deflection, of 1/360, of span length.

Modulus of elasticity as noted for “E.”

When determined by bending strength of the piece—

Allowable stress in extreme fibre in bending as noted for “f.”

Dead load—Weight of roof joist.

Weight of roof sheathing (2.5 pounds per square foot).

Weight of roof covering (2.5 pounds per square foot).

Live load—40 pounds per square foot of roof surface considered as acting normal to the surface.

(Group I.)

NATIONAL LUMBER MANUFACTURERS ASSOCIATION

RAFTER AND ROOF JOIST SPANS (20 Pound Load—Group II Covering)

MAXIMUM SPANS FOR RAFTERS AND ROOF JOISTS—UNIFORMLY LOADED												
Any slope. Live Load 20 Pounds per Square Foot												
Size of Joists or Rafters (Nominal) in Inches	Spacing of Joists or Rafters Center to Center in Inches	MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS OR FROM PLATE TO RIDGE (Without Collar Beams)										
		Determined by Bending										
		Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.										
		Limited by Deflection of 1/360 of the Span		E=1,000,000		E=1,200,000		E=1,400,000		E=1,600,000		008'1=1
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	
2 x 4	12	6—7	7—0	7—5	7—9	8—1	8—7	9—0	9—5	10—6	11—1	Ft. Ins.
	16	6—0	6—5	6—9	7—1	7—1	7—5	7—9	8—1	9—1	9—8	11—0
	24	5—4	5—7	5—10	6—2	5—9	6—2	6—5	6—8	7—2	8—0	10—0
2 x 6	12	10—2	10—10	11—5	12—0	12—5	13—1	13—9	14—4	15—0	16—7	17—1
	16	9—4	9—10	10—6	10—10	10—10	11—5	12—0	12—7	13—1	14—6	15—0
	24	8—2	8—8	9—2	9—7	9—0	9—5	9—10	10—4	11—7	12—0	12—4
2 x 8	12	13—6	14—5	15—1	15—9	16—5	17—4	18—1	18—10	19—8	20—5	21—1
	16	12—5	13—2	13—10	14—6	14—5	15—2	15—10	16—7	17—4	18—7	19—2
	24	10—10	11—7	12—2	12—9	11—10	12—6	13—1	13—8	14—4	15—9	16—4
2 x 10	12	17—0	18—1	19—0	19—10	20—6	21—7	22—2	23—8	24—7	25—6	26—2
	16	15—7	16—7	17—6	18—4	18—4	19—4	20—2	21—1	21—10	22—8	23—6
	24	13—9	14—7	15—5	16—1	15—0	16—9	17—6	17—2	18—0	19—4	20—6
2 x 12	12	20—5	21—8	22—9	23—10	24—6	25—9	27—1	28—4	29—5	30—0	30—0
	16	18—9	20—6	21—0	22—0	21—7	22—9	23—10	25—0	26—0	27—0	28—8
	24	16—7	17—7	18—7	19—5	18—0	19—0	19—10	20—9	21—7	22—5	24—0
2 x 14	12	23—9	25—3	26—6	27—9	28—4	29—10	30—0	30—0	30—0	30—0	30—0
	16	22—11	24—4	25—7	26—10	26—11	28—4	29—3	30—0	30—0	30—0	30—0
	24	19—5	20—7	21—9	22—9	21—0	22—1	23—3	24—3	25—3	26—1	28—10
3 x 6	12	11—10	12—7	13—3	13—10	15—6	16—4	17—1	17—11	18—7	19—4	20—4
	16	10—11	11—7	12—3	12—9	13—7	14—5	15—1	15—8	16—5	17—0	18—3
	24	9—7	10—3	10—9	11—3	11—4	11—11	12—6	13—0	13—7	14—1	15—0
3 x 8	12	15—7	16—7	17—5	18—3	20—3	21—4	22—4	23—4	24—5	25—3	26—1
	16	14—4	15—3	16—1	16—10	17—11	18—10	19—9	20—7	21—7	22—4	23—1
	24	12—9	13—6	14—3	14—11	14—11	15—9	16—5	17—3	18—0	18—6	19—3
3 x 10	12	19—5	20—9	21—10	22—10	25—1	26—5	27—9	28—11	30—0	30—0	30—0
	16	18—0	19—1	20—1	21—1	22—4	23—6	24—7	25—9	26—10	27—10	28—9
	24	16—0	17—0	17—11	18—9	18—7	19—7	20—7	21—6	22—5	23—3	24—1
3 x 12	12	23—3	24—9	26—0	27—3	29—9	30—0	29—4	30—0	30—0	30—0	30—0
	16	21—6	22—11	24—1	25—3	26—6	27—11	28—6	29—9	30—0	30—0	30—0
	24	19—3	20—5	21—5	22—5	22—4	23—6	24—9	25—9	26—10	27—10	28—10

NOTE.—The lengths are based on:
 When limited by deflection—
 Maximum allowable deflection of 1/360 of span length.
 Modulus of elasticity as noted for "E."
 When determined by bending strength of the piece—
 Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of roof joist.
 Weight of roof sheathing (2.5 pounds per square foot).
 Weight of roof covering (8 pounds per square foot). (Group II.)
 Live load—20 pounds per square foot of roof surface considered as acting normal to the surface.

RAFTER AND ROOF JOIST SPANS (30 Pound Load—Group II Covering)

MAXIMUM SPANS FOR RAFTERS AND ROOF JOISTS—UNIFORMLY LOADED											
Any Slope. Live Load 30 Pounds per Square Foot.											
MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS OR FROM PLATE TO RIDGE (Without Collar Beams)											
Determined by Bending											
Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.											
Size of Joists or Rafters (Nominal) in Inches	Spacing of Joists or Rafters Center to Center in Inches	Limited by Deflection of 1/360 of the Span									
		E=1,000,000		E=1,200,000		E=1,400,000		E=1,600,000		E=1,800,000	
2 x 4	12	Ft. Ins.	6—1	Ft. Ins.	6—6	Ft. Ins.	7—1	Ft. Ins.	8—2	Ft. Ins.	8—6
	16		5—7		5—11		6—2		7—2		7—5
	24		4—10		5—1		5—0		5—10		6—1
2 x 6	12		9—5		10—0		10—11		12—7		13—1
	16		8—7		9—1		9—5		11—0		11—5
	24		7—6		8—0		7—10		9—0		9—5
2 x 8	12		12—6		13—3		14—5		16—8		17—4
	16		11—6		12—1		12—7		14—7		15—1
	24		10—0		10—8		10—5		12—0		12—6
2 x 10	12		15—8		16—8		18—1		20—11		21—9
	16		14—4		15—3		15—10		18—4		19—0
	24		12—9		13—6		13—2		15—3		15—11
2 x 12	12		18—10		20—0		21—8		25—0		26—0
	16		17—5		18—4		19—0		22—0		22—11
	24		15—3		16—2		15—9		18—3		18—10
2 x 14	12		21—11		23—4		25—1		29—0		30—0
	16		20—1		21—5		22—1		25—7		26—7
	24		17—10		18—11		18—5		21—3		22—1
3 x 6	12		10—11		11—7		13—7		15—9		16—5
	16		10—0		10—7		12—0		13—10		14—5
	24		8—10		9—4		9—11		11—5		11—11
3 x 8	12		14—4		15—3		17—11		20—7		21—7
	16		13—3		14—0		15—9		18—3		19—0
	24		11—7		12—4		13—0		15—1		15—10
3 x 10	12		18—0		19—1		22—4		25—9		26—10
	16		16—7		17—7		19—5		22—9		23—7
	24		14—9		15—7		16—5		18—11		19—9
3 x 12	12		21—10		23—1		27—0		30—0		31—0
	16		20—0		21—4		23—10		27—6		28—7
	24		17—9		18—11		19—10		22—11		23—11
3 x 14	12		25—0		26—7		30—0		33—0		34—0
	16		23—3		24—7		27—4		30—4		31—4
	24		20—7		21—11		22—11		26—5		27—6

NOTE.—The lengths are based on:

- When limited by deflection—Maximum allowable deflection of 1/360 of span length.
- Modulus of elasticity as noted for "E."
- When determined by bending strength of the piece—Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of roof joist.
Weight of roof sheathing (2.5 pounds per square foot).
Weight of roof covering (8 pounds per square foot). (Group II.)
Live load—30 pounds per square foot of roof surface considered as acting normal to the surface.

NOTE.—The lengths are based on:

When limited by deflection—

Maximum allowable deflection of 1/360 of span length.

Modulus of elasticity as noted for "E."

When determined by bending strength of the piece—

Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of roof joist.

Weight of roof sheathing (2.5 pounds per square foot).

Weight of roof covering (8 pounds per square foot). (Group II.)

Live load—30 pounds per square foot of roof surface considered as acting normal to the surface.

RAFTER AND ROOF JOIST SPANS (40 Pound Load—Group II Covering)

MAXIMUM SPANS FOR ROOF JOISTS—UNIFORMLY LOADED Any Slope. Live Load 40 Pounds per Square Foot

MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS OR FROM PLATE TO RIDGE (Without Collar Beams)

Size of Joists or Rafters (Nominal) in Inches		Spacing of Joists or Rafters Center to Center in Inches	Limited by Deflection of 1/360 of the Span					Determined by Bending									
			Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.					Having determined by reference to the building code or the table on page 1 the allowable extreme fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.									
			E=1,000,000	E=1,200,000	E=1,400,000	E=1,600,000	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	
2 x 6	12	8-8	9-4	10-2	11-0	12-0	13-0	14-4	15-0	16-2	17-2	18-0	19-9	20-4	21-8	22-8	
	16	7-10	8-5	9-4	10-2	11-4	12-0	12-6	13-1	14-1	15-5	16-7	17-9	18-10	19-6	20-1	
	24	7-0	7-5	8-2	9-0	9-4	10-10	10-4	10-9	11-2	12-0	12-7	13-5	14-5	15-2	16-8	
2 x 8	12	11-7	12-4	13-0	13-6	14-4	15-0	16-2	17-2	18-0	19-9	20-4	21-8	22-8	23-8	24-4	
	16	10-7	11-2	11-9	12-5	13-0	13-7	14-1	15-5	16-6	17-9	18-10	19-6	20-1	21-8	22-8	
	24	9-4	9-10	10-5	10-10	11-4	12-0	12-6	13-1	14-1	15-5	16-7	17-9	18-10	19-6	20-1	
2 x 10	12	14-7	15-6	16-4	17-1	18-0	19-9	20-4	21-8	22-8	23-8	24-5	25-5	26-9	27-9	28-8	
	16	13-4	14-2	14-10	15-7	16-4	17-2	18-0	19-9	20-4	21-8	22-8	23-8	24-5	25-5	26-9	
	24	11-8	12-6	13-1	13-8	14-10	15-7	16-4	17-2	18-0	19-9	20-4	21-8	22-8	23-8	24-5	
2 x 12	12	17-7	18-8	19-8	20-7	21-10	22-10	23-10	24-10	25-10	26-10	27-10	28-10	29-10	30-10	31-10	
	16	16-1	17-1	18-0	18-9	19-9	20-9	21-9	22-9	23-9	24-9	25-9	26-9	27-9	28-9	29-9	
	24	14-2	15-1	15-10	16-7	17-7	18-7	19-7	20-7	21-7	22-7	23-7	24-7	25-7	26-7	27-7	
2 x 14	12	20-6	21-10	23-0	24-0	25-10	26-10	27-10	28-10	29-10	30-10	31-10	32-10	33-10	34-10	35-10	
	16	18-10	20-0	21-1	22-1	23-1	24-1	25-1	26-1	27-1	28-1	29-1	30-1	31-1	32-1	33-1	
	24	16-7	17-9	18-7	19-5	20-7	21-7	22-7	23-7	24-7	25-7	26-7	27-7	28-7	29-7	30-7	
3 x 6	12	10-3	10-10	11-5	11-11	12-5	13-3	14-3	15-3	16-3	17-3	18-3	19-3	20-3	21-3	22-3	
	16	9-4	9-11	10-5	10-11	11-5	12-5	13-5	14-5	15-5	16-5	17-5	18-5	19-5	20-5	21-5	
	24	8-3	8-9	9-3	9-7	10-3	11-3	12-3	13-3	14-3	15-3	16-3	17-3	18-3	19-3	20-3	
3 x 8	12	13-5	14-4	15-1	15-9	16-9	17-9	18-9	19-9	20-9	21-9	22-9	23-9	24-9	25-9	26-9	
	16	12-4	13-1	13-10	14-5	15-5	16-5	17-5	18-5	19-5	20-5	21-5	22-5	23-5	24-5	25-5	
	24	10-11	11-6	12-1	12-9	13-9	14-9	15-9	16-9	17-9	18-9	19-9	20-9	21-9	22-9	23-9	
3 x 10	12	16-11	17-11	18-11	19-10	20-10	21-10	22-10	23-10	24-10	25-10	26-10	27-10	28-10	29-10	30-10	
	16	15-6	16-6	17-5	18-1	19-1	20-1	21-1	22-1	23-1	24-1	25-1	26-1	27-1	28-1	29-1	
	24	13-9	14-6	15-4	16-0	17-0	18-0	19-0	20-0	21-0	22-0	23-0	24-0	25-0	26-0	27-0	
3 x 12	12	20-4	21-6	22-9	23-9	24-9	25-9	26-9	27-9	28-9	29-9	30-9	31-9	32-9	33-9	34-9	
	16	18-7	19-10	20-10	21-10	22-10	23-10	24-10	25-10	26-10	27-10	28-10	29-10	30-10	31-10	32-10	
	24	16-6	17-6	18-5	19-4	20-4	21-4	22-4	23-4	24-4	25-4	26-4	27-4	28-4	29-4	30-4	
3 x 14	12	23-7	25-1	26-5	27-7	28-7	29-7	30-7	31-7	32-7	33-7	34-7	35-7	36-7	37-7	38-7	
	16	21-9	23-1	24-4	25-5	26-5	27-5	28-5	29-5	30-5	31-5	32-5	33-5	34-5	35-5	36-5	
	24	19-4	20-6	21-7	22-6	23-6	24-6	25-6	26-6	27-6	28-6	29-6	30-6	31-6	32-6	33-6	

NOTE.—The lengths are based on:

When limited by deflection—

Maximum allowable deflection of 1/360 of span length.

Modulus of elasticity as noted for "E."

When determined by bending strength of the piece—

Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of roof joist.

Weight of roof sheathing (2.5 pounds per square foot).

Weight of roof covering (8 pounds per square foot). (Group II.)

Live load—40 pounds per square foot of roof surface considered as acting normal to the surface.

RAFTER AND ROOF JOIST SPANS (50 Pound Load—Group II Covering)

MAXIMUM SPANS FOR ROOF JOISTS—UNIFORMLY LOADED Any slope. Live Load 50 Pounds per Square Foot											
MAXIMUM ALLOWABLE LENGTHS BETWEEN SUPPORTS OR FROM PLATE TO RIDGE (Without Collar Beams)											
Size of Joists or Rafters (Nominal) in Inches	Spacing of Joists or Rafters Center to Center in Inches	Determined by Bending									
		Having determined by reference to the building code or the table on page 1 the allowable fibre stress in bending in pounds per square inch for the species and grade of lumber used, refer to the column below with the corresponding value to determine maximum safe span.									
		Limited by Deflection of 1/360 of the Span Having determined by reference to the building code or the table on page 1 the allowable modulus of elasticity in pounds per square inch for the species of timber used, refer to the column below with the corresponding value to determine span.									
		E=1,000,000		E=1,200,000		E=1,400,000		E=1,600,000		f=900	
		Ft. Ins.	In.	Ft. Ins.	In.	Ft. Ins.	In.	Ft. Ins.	In.	Ft. Ins.	In.
2 x 6	12	8—4	8—10	9—4	9—9	9—0	9—7	10—0	10—6	12—8	13—4
	16	7—7	8—0	8—5	8—10	7—11	8—3	8—8	9—0	10—6	11—8
	24	6—8	7—1	7—5	7—9	6—6	6—9	7—2	7—6	9—0	9—6
2 x 8	12	11—0	11—9	12—4	12—11	12—0	12—8	13—4	13—11	14—6	15—0
	16	10—1	10—8	11—4	11—9	10—6	11—0	11—8	12—1	12—7	13—1
	24	8—10	9—5	9—11	10—5	8—7	9—0	9—6	9—11	10—4	10—9
2 x 10	12	14—0	14—9	15—7	16—4	15—2	16—0	16—9	17—6	18—3	18—11
	16	12—9	13—6	14—3	14—10	13—3	13—11	14—8	15—3	15—11	16—6
	24	11—2	11—11	12—6	13—1	10—10	11—6	12—0	12—7	13—1	13—7
2 x 12	12	16—9	17—10	18—9	19—8	18—3	19—2	20—2	21—0	21—11	22—9
	16	15—4	16—4	17—2	18—0	15—11	16—10	17—7	18—5	19—2	19—9
	24	13—6	14—4	15—1	15—10	13—2	13—10	14—6	15—2	15—9	16—5
2 x 14	12	19—5	20—9	21—10	22—10	21—0	22—3	23—3	24—4	25—4	26—3
	16	17—10	19—0	19—11	20—11	18—5	19—5	20—5	21—4	22—3	23—0
	24	15—9	16—9	17—5	18—4	15—3	16—1	16—11	17—7	18—4	19—0
3 x 6	12	9—7	10—3	10—10	11—3	11—4	12—0	12—6	13—1	13—7	14—1
	16	8—10	9—4	9—10	10—4	9—11	10—5	11—0	11—5	11—11	12—4
	24	7—9	8—3	8—7	9—0	8—1	8—7	9—0	9—5	9—10	10—0
3 x 8	12	12—9	13—6	14—3	14—11	14—11	15—9	16—6	17—3	18—1	18—7
	16	11—9	12—5	13—0	13—7	13—1	13—10	14—6	15—1	15—10	16—4
	24	10—3	10—11	11—6	12—0	10—10	11—5	11—11	12—5	13—1	13—6
3 x 10	12	16—1	17—0	17—11	18—10	18—10	19—10	20—10	21—9	22—7	23—5
	16	14—9	15—7	16—5	17—3	16—5	17—4	18—3	19—0	19—9	20—6
	24	12—11	13—10	14—6	15—1	13—7	14—4	15—0	15—9	16—4	16—11
3 x 12	12	19—3	20—6	21—6	22—6	22—5	23—7	24—9	25—10	26—11	27—11
	16	17—9	18—10	19—10	20—9	19—9	20—10	21—10	22—10	23—9	24—7
	24	15—7	16—7	17—6	18—3	16—4	17—3	18—1	18—11	19—7	20—5
3 x 14	12	22—5	23—10	25—1	26—3	26—0	27—5	28—9	30—0	30—7	31—10
	16	20—7	21—11	23—1	24—1	22—11	24—3	25—5	26—6	27—7	28—10
	24	18—3	19—5	20—5	21—5	19—1	20—1	21—1	22—0	22—11	23—10

NOTE.—The lengths are based on:

When limited by deflection—

Maximum allowable deflection of 1/360 of span length.

Modulus of elasticity as noted for "E."

When determined by bending strength of the piece—

Allowable stress in extreme fibre in bending as noted for "f."

Dead load—Weight of roof joist.

Weight of roof sheathing (2.5 pounds per square foot).

Weight of roof covering (8 pounds per square foot). (Group II.)

Live load—50 pounds per square foot of roof surface considered as acting normal to the surface.

PROPERTIES OF AMERICAN STANDARD YARD LUMBER AND TIMBER SIZES

Size (Nominal in Inches)	American Standard Dressed Size Inches	Area of Section A=bd. Sq. In.	Weight per lin. foot* Pounds	Moment of Inertia $I = \frac{bd^3}{12}$	Section Modulus $S = \frac{bd^2}{6}$	Size (Nominal in Inches)	American Standard Dressed Size Inches	Area of Section A=bd. Sq. In.	Weight per lin. foot* Pounds	Moment of Inertia $I = \frac{bd^3}{12}$	Section Modulus $S = \frac{bd^2}{6}$
2 x 4	1 5/8 x 3 5/8	5.89	1.6	6.45	3.56	10 x 20	9 1/2 x 19 1/2	185.25	51.4	5870.05	602.06
2 x 6	1 5/8 x 5 5/8	9.14	2.5	24.10	8.57	10 x 22	9 1/2 x 21 1/2	204.25	56.7	7867.81	731.89
2 x 8	1 5/8 x 7 1/2	12.19	3.4	57.13	15.32	10 x 24	9 1/2 x 23 1/2	223.25	62.0	10274.06	874.39
2 x 10	1 5/8 x 9 1/2	15.44	4.3	116.09	24.44	10 x 26	9 1/2 x 25 1/2	242.25	67.3	13126.81	1029.56
2 x 12	1 5/8 x 11 1/2	18.69	5.2	205.94	35.82	10 x 28	9 1/2 x 27 1/2	261.25	72.5	16465.24	1197.39
2 x 14	1 5/8 x 13 1/2	23.62	6.5	333.15	49.36	10 x 30	9 1/2 x 29 1/2	280.25	77.8	20323.79	1377.89
2 x 16	1 5/8 x 15 1/2	25.18	7.0	504.24	65.07	12 x 12	11 1/2 x 11 1/2	132.25	36.7	1457.50	253.47
2 x 18	1 5/8 x 17 1/2	28.43	7.9	725.71	82.94	12 x 14	11 1/2 x 13 1/2	155.25	43.1	2357.85	349.31
2 x 20	1 5/8 x 19 1/2	31.69	8.8	1004.05	102.98	12 x 16	11 1/2 x 15 1/2	178.25	49.5	3568.70	460.48
3 x 4	2 5/8 x 3 5/8	9.51	2.6	10.42	5.75	12 x 18	11 1/2 x 17 1/2	201.25	55.9	5136.49	586.98
3 x 6	2 5/8 x 5 5/8	14.76	4.2	38.93	13.84	12 x 20	11 1/2 x 19 1/2	224.25	62.3	7105.90	728.81
3 x 8	2 5/8 x 7 1/2	19.68	5.7	92.28	24.60	12 x 22	11 1/2 x 21 1/2	247.25	68.7	9524.24	885.98
3 x 10	2 5/8 x 9 1/2	24.93	7.2	187.55	39.48	12 x 24	11 1/2 x 23 1/2	270.25	75.0	12437.08	1058.47
3 x 12	2 5/8 x 11 1/2	30.18	8.8	332.69	57.86	12 x 26	11 1/2 x 25 1/2	293.25	81.4	15890.42	1246.31
3 x 14	2 5/8 x 13 1/2	35.43	10.3	538.21	79.73	12 x 28	11 1/2 x 27 1/2	316.25	87.8	19932.58	1449.47
3 x 16	2 5/8 x 15 1/2	40.68	11.3	814.60	105.11	12 x 30	11 1/2 x 29 1/2	339.25	94.2	24602.61	1667.97
3 x 18	2 5/8 x 17 1/2	45.94	12.8	1172.36	133.98	14 x 14	13 1/2 x 13 1/2	182.25	50.6	2767.92	410.06
3 x 20	2 5/8 x 19 1/2	51.19	14.21	1622.00	166.36	14 x 16	13 1/2 x 15 1/2	209.25	58.1	4189.36	540.56
4 x 4	3 5/8 x 3 5/8	13.14	3.6	14.38	7.94	14 x 18	13 1/2 x 17 1/2	236.25	65.6	6029.29	689.06
4 x 6	3 5/8 x 5 5/8	20.39	5.7	53.76	19.11	14 x 20	13 1/2 x 19 1/2	263.25	73.1	8341.73	855.56
4 x 8	3 5/8 x 7 1/2	27.18	7.5	127.44	33.98	14 x 22	13 1/2 x 21 1/2	290.25	80.6	11180.67	1040.06
4 x 10	3 5/8 x 9 1/2	34.43	9.6	258.99	54.52	14 x 24	13 1/2 x 23 1/2	317.25	88.1	14600.10	1242.56
4 x 12	3 5/8 x 11 1/2	41.68	11.6	459.42	79.90	14 x 26	13 1/2 x 25 1/2	344.25	95.6	18654.04	1463.06
4 x 14	3 5/8 x 13 1/2	48.93	13.6	743.23	110.11	14 x 28	13 1/2 x 27 1/2	371.25	103.1	23398.73	1701.56
4 x 16	3 5/8 x 15 1/2	56.18	15.6	1124.90	145.15	14 x 30	13 1/2 x 29 1/2	398.25	110.6	28881.42	1958.06
4 x 18	3 5/8 x 17 1/2	63.43	17.6	1618.96	185.02	16 x 16	15 1/2 x 15 1/2	240.25	66.7	4809.98	620.64
4 x 20	3 5/8 x 19 1/2	70.69	19.6	2239.88	229.73	16 x 18	15 1/2 x 17 1/2	271.25	75.3	6922.49	791.14
6 x 6	5 1/2 x 5 1/2	30.25	8.4	76.25	27.73	16 x 20	15 1/2 x 19 1/2	302.25	83.9	9577.50	982.31
6 x 8	5 1/2 x 7 1/2	41.25	11.4	193.35	51.56	16 x 22	15 1/2 x 21 1/2	333.25	92.5	12337.00	1194.14
6 x 10	5 1/2 x 9 1/2	52.25	14.5	392.96	82.73	16 x 24	15 1/2 x 23 1/2	364.25	101.2	16763.00	1426.64
6 x 12	5 1/2 x 11 1/2	63.25	17.5	697.06	121.23	16 x 26	15 1/2 x 25 1/2	395.25	109.8	21417.50	1679.81
6 x 14	5 1/2 x 13 1/2	74.25	20.6	1127.66	167.06	16 x 28	15 1/2 x 27 1/2	426.25	118.4	26863.78	1953.64
6 x 16	5 1/2 x 15 1/2	85.25	23.6	1706.76	220.22	16 x 30	15 1/2 x 29 1/2	457.25	127.0	33159.98	2248.14
6 x 18	5 1/2 x 17 1/2	96.25	26.7	2456.36	280.73	18 x 18	17 1/2 x 17 1/2	306.25	85.0	7815.73	893.23
6 x 20	5 1/2 x 19 1/2	107.25	29.8	3398.46	348.56	18 x 20	17 1/2 x 19 1/2	341.25	94.8	10813.33	1109.06
6 x 22	5 1/2 x 21 1/2	118.25	32.8	4555.05	423.73	18 x 22	17 1/2 x 21 1/2	376.25	104.5	14493.43	1348.23
8 x 8	7 1/2 x 7 1/2	56.25	15.6	263.67	70.31	18 x 24	17 1/2 x 23 1/2	411.25	114.2	18926.02	1610.72
8 x 10	7 1/2 x 9 1/2	71.25	19.8	535.85	112.81	18 x 26	17 1/2 x 25 1/2	446.25	123.9	24181.11	1896.56
8 x 12	7 1/2 x 11 1/2	86.25	23.9	950.55	165.31	18 x 28	17 1/2 x 27 1/2	481.25	133.7	30331.62	2205.72
8 x 14	7 1/2 x 13 1/2	101.25	28.0	1537.73	227.81	18 x 30	17 1/2 x 29 1/2	516.25	143.4	37438.79	2538.22
8 x 16	7 1/2 x 15 1/2	116.25	32.0	2327.42	300.31	20 x 20	19 1/2 x 19 1/2	380.25	105.6	12049.49	1235.81
8 x 18	7 1/2 x 17 1/2	131.25	36.4	3349.60	382.81	20 x 22	19 1/2 x 21 1/2	419.25	116.4	16149.86	1502.31
8 x 20	7 1/2 x 19 1/2	146.25	40.6	4634.30	475.31	20 x 24	19 1/2 x 23 1/2	458.25	127.3	21089.04	1794.81
8 x 22	7 1/2 x 21 1/2	161.25	44.8	6211.48	577.81	20 x 26	19 1/2 x 25 1/2	497.25	138.1	26944.73	2113.31
8 x 24	7 1/2 x 23 1/2	176.25	48.9	8111.17	690.31	20 x 28	19 1/2 x 27 1/2	536.25	148.9	33798.17	2457.81
10 x 10	9 1/2 x 9 1/2	90.25	25.0	678.75	142.89	20 x 30	19 1/2 x 29 1/2	575.25	159.8	41717.61	2828.31
10 x 12	9 1/2 x 11 1/2	109.25	30.3	1204.01	209.39	24 x 24	23 1/2 x 23 1/2	552.25	153.4	25414.96	2162.97
10 x 14	9 1/2 x 13 1/2	128.25	35.6	1947.78	288.56	24 x 26	23 1/2 x 25 1/2	599.25	166.4	32471.80	2546.81
10 x 16	9 1/2 x 15 1/2	147.25	40.9	2948.04	380.39	24 x 28	23 1/2 x 27 1/2	646.25	179.5	40731.06	2916.97
10 x 18	9 1/2 x 17 1/2	166.25	46.1	4242.80	484.89	24 x 30	23 1/2 x 29 1/2	693.25	192.5	50274.98	3408.47

* Based on assumed average weight of 40 lbs. per cu. ft.

AVERAGE WEIGHTS OF VARIOUS MATERIALS

(These weights were used to determine dead loads in obtaining the span lengths in tables.)

Finished floor.....	2.5 lbs. per sq. ft.	Sheathing.....	2.5 lbs. per sq. ft.
Rough floor.....	2.5 lbs. per sq. ft.	Plaster.....	10.0 lbs. per sq. ft.

ROOFING

Group I—Assumed as 2.5 lbs. per sq. ft. including:	
Shingles.....	2.5 lbs. per sq. ft.
Copper sheets.....	1.5 lbs. per sq. ft.
Copper tile.....	1.75 lbs. per sq. ft.
Three-ply ready roofing.....	1.00 lbs. per sq. ft.

Group II—Assumed as 8 lbs. per sq. ft. including:

Five-ply felt and gravel.....	7 lbs. per sq. ft.
Slate, 3/16 inch.....	7 1/4 lbs. per sq. ft.
Roman tile—new style—1 part.....	8 lbs. per sq. ft.
Spanish tile—new style—1 part.....	8 lbs. per sq. ft.
Ludowici tile.....	8 lbs. per sq. ft.

WHERE ADDITIONAL SPECIFIC LUMBER INFORMATION MAY BE OBTAINED

AS the publications of the National Lumber Manufacturers Association deal with lumber in general, it is suggested that those desiring additional information regarding the respective species of woods listed below should make requests for definitions, grading rules, and publications concerning the special advantages and characteristics of each species to the following member associations affiliated with the National Lumber Manufacturers Association:

CALIFORNIA REDWOOD ASSOCIATION,
San Francisco, Calif.

Redwood

CALIFORNIA WHITE AND SUGAR PINE
MANUFACTURERS ASSOCIATION,
San Francisco, Calif.

*Sugar Pine, California White Pine, White Fir,
Douglas Fir, Incense Cedar*

HARDWOOD MANUFACTURERS INSTITUTE,
Memphis, Tenn.

*Ash, Basswood, Beech, Birch, Cherry, Cypress, Chestnut,
Cottonwood, Elm, Gum, Hickory, Maple, Magnolia,
Oak, Poplar, Sycamore, Tupelo, Willow,
Walnut, Aromatic Red Cedar*

NORTH CAROLINA PINE ASSOCIATION,
Norfolk, Va., and Macon, Ga.

North Carolina Pine

NORTHERN PINE MANUFACTURERS
ASSOCIATION,
Minneapolis, Minn.

*Northern White Pine
Norway Pine, Eastern Spruce, Tamarack*

NORTHERN HEMLOCK AND HARDWOOD
MANUFACTURERS ASSOCIATION,
Oshkosh, Wis.

*Hemlock, Birch, Maple, Basswood, Elm, Ash, Beech,
Tamarack, White Pine*

SOUTHERN CYPRESS MANUFACTURERS
ASSOCIATION,
Jacksonville, Fla.
Cypress, Tupelo

SOUTHERN PINE ASSOCIATION,
New Orleans, La.

Longleaf and Shortleaf Southern Pine

WEST COAST LUMBERMEN'S ASSOCIATION,
Seattle, Wash., and Portland, Oreg.

*Douglas Fir, West Coast Hemlock, Sitka Spruce,
Western Red Cedar, Port Orford Cedar*

WESTERN PINE MANUFACTURERS
ASSOCIATION,
Portland, Oreg.

*Pondosa Pine, Idaho White Pine, Larch, Douglas Fir,
White Fir, Cedar and Spruce*

NATIONAL LUMBER MANUFACTURERS ASSOCIATION

Transportation Building
Washington, D. C.

FIELD OFFICES

New York Boston Pittsburgh	Chicago Indianapolis Minneapolis Kansas City Los Angeles	San Francisco New Orleans Memphis
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Cooperating Organizations

British Columbia Loggers Association.
British Columbia Lumber & Shingle Manufacturers Association.
Maple Flooring Manufacturers Association.
National-American Wholesale Lumber Association.
National Association of Wooden Box Manufacturers.
Oak Flooring Manufacturers Association of the United States.
Red Cedar Shingle Bureau.
Service Bureau—American Wood Preservers Association.
Wood Office Furniture Associates, Inc.

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Printed in U. S. A.

Supplement to Maximum Spans for Joists and Rafters, Chapter IV.



WORKING STRESSES FOR STRUCTURAL LUMBER AND TIMBER

The economic utilization of lumber and timber demands design practices predicated on scientifically ascertained facts as to their physical and mechanical properties.

Working stresses appropriate to the qualities and characteristics of the material under its use conditions and which will allow full realization of the utility of the structural member within safe limits are provided herein for the species and grades of lumber commonly used for structural and load bearing purposes. The allowable working stresses given in Tables I, III and IV, and the safe column loads in Tables II, V and VI should be used as the basis for design with lumber unless the local building code otherwise provides.

The reference to minimum quality and the tables of allowable stresses and column loads are arranged in suitable form for inclusion in building codes and for the use of designers. The stresses given in these tables are, as indicated, either for manufacturers association Standard Commercial grades based on, or for lumber graded under, the structural grade examples given in the American Lumber Standards published by the Bureau of Standards, U. S. Department of Commerce in Simplified Practice Recommendation No. R. 16-29-Lumber - Fourth Edition. If lumber is used which is not of Association American Standard grades, or graded under the Structural grade examples, then proportionately lower stresses should be used.

NATIONAL LUMBER MANUFACTURERS ASSOCIATION
Washington, D. C.

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SECTION THE SIZE OF ALL WOOD STRUCTURAL MEMBERS shall be sufficient to carry the imposed loads safely and without exceeding the allowable working stresses as hereinafter specified. Where minimum sizes are required by this code, they refer to the nominal size, but in computations to determine the required size of lumber members, the net cross-section area or actual size shall be used and not the nominal size. American Standard dressed sizes shall be accepted as conforming with the corresponding nominal sizes required.

SECTION THE MAXIMUM ALLOWABLE WORKING STRESSES for lumber and timber in pounds per square inch of net cross-section area shall not exceed the values given in Tables I and II for the grades of the respective species, based on American Lumber Standards.

- (a) STRESSES FOR GRADES NOT GIVEN IN THE TABLES shall be established by the Chief Building Inspector.
- (b) STRESSES DUE TO DEAD AND LIVE LOADS, acting singly or in combination, but without wind loads, shall not exceed the allowable stress for the respective species. For stresses produced by wind loads only, or by a combination of wind loads and dead and live loads, the allowable stresses herein permitted may be increased 50% providing the resulting sections are not less than those required for dead and live loads alone.
- (c) FOR DIRECT TENSION the same values as for extreme fibre stress in bending may be used.
- (d) USING THE STRESSES FOR TIMBERS given in the following tables no allowance need be made for impact when the impact stress produced by any load does not exceed the live load stress.
- (e) SHEARING STRESS FOR JOINT DETAILS may, for all grades, be taken as 50% greater than the horizontal shear values otherwise permitted.
- (f) IN THE CASE OF JOISTS SUPPORTED on a ribbon board and spiked to the studding, the allowable stress in compression across the grain may be increased 50% above that specified.

SECTION THE MINIMUM QUALITY OF LUMBER AND TIMBER used structurally and for load bearing purposes shall be of commercial grades in nominal thicknesses, as follows:

- (a) STUDDING, POSTS, AND SIMILAR LOAD BEARING MEMBERS shall be not lower in grade than No. 2 Common Dimension.
- (b) BEAMS, GIRDERS, JOISTS, RAFTERS, PLANK, AND SIMILAR LOAD BEARING MEMBERS less than five inches thick shall be of a grade equal to or better than No. 1 Common Dimension.
- (c) LUMBER FIVE INCHES (5") THICK AND THICKER shall be of a grade not lower than the lowest grade for which working stresses are given in Table I.
- (d) LUMBER AND TIMBER TO BE ACCEPTED AS OF GRADES qualifying for working stresses higher than those permitted for the lowest grade provided for in Table I, shall bear an official grade mark or otherwise be identified by an acceptably authenticated certificate.

WORKING STRESSES

All computations to determine the required sizes of lumber members should be based on the net cross-sectional area or actual size. The size of members should be sufficient to carry the imposed load safely and without exceeding the allowable working stresses given in Table I.

TABLE I. ALLOWABLE UNIT STRESSES FOR STRUCTURAL LUMBER AND TIMBER							
All Sizes, Dry Locations							
Species of Timber	Grade	Allowable Unit Stress in Pounds per Square Inch					Modulus of Elasticity
		Extreme Fibre in Bending		Maximum Horizontal Shear	Compression		
		Joist & Plank Sizes; 4" and less in thickness	Beam & Stringer Sizes; 5" & Thicker			Parallel to grain (short columns)	Perpendicular to grain
Table I - A Working Stresses for Manufacturers Association Standard Commercial Grades							
Douglas Fir, Coast Region	Dense Super-Structural	2000	2000	120	1466	380	1,600,000
	Super-Structural & Dense Structural	1800	1800	105	1300	345	1,600,000
	Structural	1600	1600	90	1200	345	1,600,000
	Common Structural	1200	1400	84	1100	325	1,600,000
Douglas Fir, Inland Empire	Dense Super-Structural	2000	2000	120	1466	380	1,600,000
	Dense Structural	1800	1800	105	1300	345	1,600,000
	No. 1 Common Dimension & Timbers	1135	1135	70	1010	315	1,500,000
Larch, Western	No. 1 Common Dimension & Timbers	1135	1135	70	1010	325	1,300,000
Pine, Southern Yellow	Extra Dense Select Structural	2300	2300	200	1600	475	1,600,000
	Select Structural	2000	2000	175	1450	375	1,600,000
	Extra Dense Heart	2000	2000	175	1450	475	1,600,000
	Dense Heart	1800	1800	150	1300	375	1,600,000
	Structural Sq. Edge & Sound	1600	1600	125	1200	375	1,600,000
	No. 1 Common	1200	1200	100	1000	325	1,600,000
Redwood	Super-Structural	2133	1707	93	1422	267	1,200,000
	Prime Structural	1707	1494	82	1245	267	1,200,000
	Select Structural	1280	1322	70	1100	267	1,200,000
	Heart Structural	1024	1150	56	1000	267	1,200,000
Table I-B Working Stresses for Structural Lumber and Timber Graded under the Structural Grade Examples of the American Lumber Standards							
Cedar, Alaska	Select Structural	1100	1100	90	800	250	1,200,000
	Common Structural	880	880	72	640	250	1,200,000
Cedar, Northern & Southern White	Select Structural	750	750	70	550	175	800,000
	Common Structural	600	600	56	440	175	800,000
Cedar, Port Orford	Select Structural	1100	1100	90	900	250	1,200,000
	Common Structural	880	880	72	720	250	1,200,000
Cedar, Western Red	Select Structural	900	900	80	700	200	1,000,000
	Common Structural	720	720	64	560	200	1,000,000
Cypress, Southern	Select Structural	1300	1300	100	1100	350	1,200,000
	Common Structural	1040	1040	80	880	350	1,200,000
Douglas Fir, Rocky Mountain Region	Select Structural	1100	1100	85	800	275	1,200,000
	Common Structural	880	880	68	640	275	1,200,000
Fir, Balsam	Select Structural	900	900	70	700	150	1,000,000
	Common Structural	720	720	56	560	150	1,000,000
Fir, Golden, Noble, Silver, White, (Commercial White)	Select Structural	1100	1100	70	700	300	1,100,000
	Common Structural	880	880	56	560	300	1,100,000
Hemlock, Eastern	Select Structural	1100	1100	70	700	300	1,100,000
	Common Structural	880	880	56	560	300	1,100,000
Hemlock, West Coast	Select Structural	1300	1300	75	900	300	1,400,000
	Common Structural	1040	1040	60	720	300	1,400,000
Oak, Commercial White and Red	Select Structural	1400	1400	125	1000	500	1,500,000
	Common Structural	1120	1120	100	800	500	1,500,000
Pine, Calif., Idaho & No. White, Lodgepole, Ponderosa, Sugar	Select Structural	900	900	85	750	250	1,000,000
	Common Structural	720	720	68	600	250	1,000,000
Pine, Norway	Select Structural	1100	1100	85	800	300	1,200,000
	Common Structural	880	880	68	640	300	1,000,000
Spruce, Englemann	Select Structural	750	750	70	600	175	800,000
	Common Structural	600	600	56	480	175	800,000
Spruce, Red, White, Sitka	Select Structural	1100	1100	85	800	250	1,200,000
	Common Structural	880	880	68	640	250	1,200,000
Tamarack, Eastern	Select Structural	1200	1200	95	1000	300	1,300,000
	Common Structural	960	960	76	800	300	1,300,000

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All Timber Columns, Posts and other vertical supports shall be of sufficient strength to safely support the combined live and dead loads transmitted to them.

Safe Loads and allowable working stresses in compression parallel to grain for timber columns shall not exceed in pounds per square inch the values given in the following table for the respective species, grade, and ratio of unsupported length to least dimension (L/d):

TABLE II - SAFE LOAD IN POUNDS PER SQUARE INCH OF CROSS-SECTIONAL AREA OF SQUARE AND RECTANGULAR TIMBER COLUMNS (Dry Locations)

Species of Timber	Grade	* Ratio of Length to Least Dimension (L/d)										
		10 & less lbs.	L/d 12 lbs.	L/d 14 lbs.	L/d 16 lbs.	L/d 18 lbs.	L/d 20 lbs.	L/d 25 lbs.	L/d 30 lbs.	L/d 35 lbs.	L/d 40 lbs.	L/d 50 lbs.
Table II - A Allowable Column Loads for Manufacturers Association Standard Commercial Grades												
Douglas fir, Coast Region	Dense Super-Str.	1466	1416	1373	1307	1215	1079	702	487	358	274	175
	Super-Str. and Dense Structural	1300	1264	1235	1189	1123	1027	702	487	358	274	175
	Structural	1200	1176	1152	1112	1059	986	702	487	358	274	175
	Com. Structural	1100	1079	1060	1032	992	937	702	487	358	274	175
Douglas fir, Inland Empire	Dense Super-Str.	1466	1416	1373	1307	1215	1079	702	487	358	274	175
	Dense Structural	1300	1264	1235	1189	1123	1027	702	487	358	274	175
	No. 1 Com. Dimen. & Timbers	1010	982	966	943	907	860	625	457	336	257	164
Larch, western	No. 1 Com. Dimen. & Timbers	1010	984	964	933	885	818	566	396	291	223	142
Pine, Southern Yellow	Extra Dense Heart	1450	1400	1355	1300	1195	1065	701	487	358	274	175
	Dense heart	1300	1265	1235	1190	1125	1027	701	487	358	274	175
	Str. Sq. Edge & Sound	1200	1174	1150	1110	1062	984	701	487	358	274	175
	No. 1 Common	1000	984	970	950	920	880	700	487	358	274	175
Redwood	Super-Structural	1422	1339	1272	1165	1023	822	526	365	268	206	132
	Prime Structural	1245	1139	1142	1073	971	822	526	365	268	206	132
	Select Structural	1100	1063	1029	979	907	807	526	365	268	206	132
	Heart Structural	1000	972	947	910	858	782	526	365	268	206	132
Table II-3 Allowable Column Loads for Structural Lumber and Timber Graded under the Structural Grade Examples of the American Lumber Standards												
Cedar, Alaska	Select Structural	793	786	774	753	726	688	526	365	268	206	132
	Common Structural	636	632	627	617	602	582	500	365	268	206	132
Cedar, Northern & Southern White	Select Structural	545	540	530	516	496	468	351	244	179	137	88
	Common Structural	437	435	430	423	412	398	338	244	179	137	88
Cedar, Port Orford	Select Structural	890	879	861	834	796	741	526	365	268	206	132
	Common Structural	715	709	700	686	667	639	521	365	268	206	132
Cedar, Western Red	Select Structural	693	686	674	656	629	592	438	304	224	171	110
	Common Structural	557	553	547	538	524	506	425	304	224	171	110
Cypress, Southern	Select Structural	1032	1063	1030	981	909	810	526	365	268	206	132
	Common Structural	870	861	843	813	781	729	526	365	268	206	132
Douglas fir, Rocky Mt. Type	Select Structural	793	786	774	753	726	688	526	365	268	206	132
	Common Structural	636	632	627	617	602	582	500	365	268	206	132
Fir, Balsam	Select Structural	693	686	674	656	629	592	438	304	224	171	110
	Common Structural	557	553	547	538	524	505	425	304	224	171	110
Fir, Commercial White	Select Structural	694	689	678	664	641	611	482	335	246	188	121
	Common Structural	557	554	549	542	530	515	449	335	246	188	121
Hemlock, Eastern	Select Structural	694	689	678	664	641	611	482	335	246	188	121
	Common Structural	557	554	549	542	530	515	449	335	246	188	121
Hemlock, West Coast	Select Structural	893	885	872	852	823	783	614	426	313	240	153
	Common Structural	716	712	706	696	680	660	573	426	313	240	153
Pine, California, Idaho, and Northern white, Ponderosa, and sugar	Select Structural	742	733	718	695	663	617	438	304	224	171	110
	Common Structural	596	591	583	572	556	532	434	304	224	171	110
Pine, Norway	Select Structural	793	786	774	753	726	688	526	365	268	206	132
	Common Structural	636	632	627	617	602	582	500	365	268	206	132
Spruce, Englemann	Select Structural	594	586	574	556	530	494	351	244	179	137	88
	Common Structural	476	473	466	457	444	426	347	244	179	137	88
Spruce, red, white, and Sitka	Select Structural	793	786	774	753	726	688	526	365	268	206	132
	Common Structural	636	632	627	617	602	582	500	365	268	206	132
Tamarack	Select Structural	988	976	955	923	877	817	570	396	291	223	142
	Common Structural	794	788	777	761	737	706	566	396	291	223	142

* For columns with L/d intermediate between those which are given in this table, the safe load in pounds per square inch may be determined by interpolation.

No column shall be used with greater unsupported length than 50 times its least diameter.

TABLE III. ALLOWABLE UNIT STRESSES FOR STRUCTURAL LUMBER AND TIMBER

(Used in Locations Occasionally Wet)

(Occasionally wet but quickly dried shall apply to use in such exterior structures as bridges, trestles, grandstands, bleachers, and exposed frame work of open sheds.)

Species of Timber	Grade	Allowable Unit Stress in Pounds per Square Inch					
		Extreme Fibre in Bending		Maximum Horizontal Shear	Compression		Modulus of Elasticity
		Joist & Plank Sizes; 4" and less in thickness	Beam & Stringer Sizes; 5" & Thicker		Parallel to grain (short columns)	Perpendicular to grain	
Table III - A Working Stresses for Manufacturers Association Standard Commercial Grades							
Douglas Fir, Coast Region	Dense Super-Structural	1500	1733	120	1333	265	1,600,000
	Super-Structural and Dense Structural	1400	1560	105	1200	240	1,600,000
	Structural	1240	1400	90	1100	240	1,600,000
	Common Structural	980	1200	84	1000	225	1,600,000
Douglas Fir, Inland Empire	*Dense Super-Structural	1500	1733	120	1333	265	1,600,000
	*Dense Structural	1400	1560	105	1200	240	1,600,000
	No. 1 Common Dimension and Timbers	975	--	70	830	225	1,500,000
Larch, Western	No. 1 Common Dimension and Timbers	975	--	70	830	225	1,300,000
Pine, Southern Yellow	Extra Dense Select Structural	1900	1900	200	1450	375	1,600,000
	Select Structural	1700	1700	175	1300	300	1,600,000
	Extra Dense Heart	1700	1700	175	1300	375	1,600,000
	Dense Heart	1500	1500	150	1150	300	1,600,000
	Structural, Sq. Edge & Sound	1350	1350	125	1050	300	1,600,000
	No. 1 Common	1050	1050	100	900	250	1,600,000
Redwood	Super-Structural	1420	1422	93	1280	160	1,200,000
	Prime Structural	1182	1245	82	1120	160	1,200,000
	Select Structural	948	1100	70	990	160	1,200,000
	Heart Structural	805	960	56	900	160	1,200,000
Table III-B Working Stresses for Structural Lumber and Timber Graded under the Structural Grade Examples of the American Lumber Standards							
Cedar, Alaska	Select Structural	890	1000	90	744	200	1,200,000
	Common Structural	760	800	72	597	200	1,200,000
Cedar, Northern & Southern White	Select Structural	580	650	70	496	140	800,000
	Common Structural	490	520	56	398	140	800,000
Cedar, Port Orford	Select Structural	890	1000	90	818	200	1,200,000
	Common Structural	760	800	72	656	200	1,200,000
Cedar, Western Red	Select Structural	710	800	80	693	150	1,000,000
	Common Structural	600	640	64	557	150	1,000,000
Cypress, Southern	Select Structural	980	1100	100	986	250	1,200,000
	Common Structural	830	880	80	793	250	1,200,000
Douglas Fir, Rocky Mountain Region	Select Structural	800	900	85	793	225	1,200,000
	Common Structural	680	720	68	636	225	1,200,000
Fir, Balsam	Select Structural	670	750	70	595	125	1,000,000
	Common Structural	570	600	56	478	125	1,000,000
Fir, Golden, Noble, Silver, White, (Commercial White)	Select Structural	800	900	70	694	225	1,100,000
	Common Structural	630	720	56	557	225	1,100,000
Hemlock, Eastern	Select Structural	800	900	70	694	225	1,100,000
	Common Structural	630	720	56	557	225	1,100,000
Hemlock, West Coast	Select Structural	930	1100	75	893	225	1,400,000
	Common Structural	830	880	60	716	225	1,400,000
Pine, Calif., Idaho & No. White, Lodgepole, Ponderosa, Sugar	Select Structural	710	800	85	742	150	1,000,000
	Common Structural	600	640	68	596	150	1,000,000
Pine, Norway	Select Structural	990	1000	85	793	175	1,200,000
	Common Structural	760	800	68	637	175	1,200,000
Spruce, Englemann	Select Structural	590	650	70	545	140	800,000
	Common Structural	490	520	56	437	140	800,000
Spruce, Red, White, Sitka	Select Structural	800	900	85	744	150	1,200,000
	Common Structural	630	720	68	597	150	1,200,000
Tamarack, Eastern	Select Structural	980	1100	95	992	225	1,300,000
	Common Structural	830	880	76	716	225	1,300,000

TABLE IV. ALLOWABLE UNIT STRESSES FOR STRUCTURAL LUMBER AND TIMBER

(Used in Locations Usually Wet)

(Usually wet or more or less continuously damp applies to use where material is exposed to waves of tide water or in contact with earth or used in a building in portions that would be more or less continuously wet)

Species of Timber	Grade	Allowable Unit Stress in Pounds per Square Inch					
		Extreme Fibre in Bending		Maximum Horizontal Shear	Compression		Modulus of Elasticity
		Joist & Plank sizes; 4" and less in thickness	Beam & Stringer Sizes; 5" & thicker		Parallel to grain (short columns)	Perpendicular to grain	
Table IV - A Working Stresses for Manufacturers Association Standard Commercial Grades							
Douglas fir, Coast Region	Dense Super-Structural	1150	1333	120	1133	235	1,600,000
	Super-Structural and Dense Structural	1080	1200	105	1000	215	1,600,000
	Structural	950	1100	90	933	215	1,600,000
	Common Structural	750	933	84	850	200	1,600,000
Douglas fir, Inland Empire	* Dense Super-Structural	1150	1333	120	1133	235	1,600,000
	* Dense Structural	1080	1200	105	1000	215	1,600,000
	No. 1 Common Dimension and Timbers	705	--	70	655	200	1,500,000
Larch, Western	No. 1 Common Dimension and Timbers	705	--	70	655	200	1,300,000
Pine, Southern Yellow	Extra Dense Select Structural	1500	1500	200	1200	325	1,600,000
	Select Structural	1300	1300	175	1100	250	1,600,000
	Extra Dense Heart	1300	1300	175	1100	325	1,600,000
	Dense Heart	1200	1200	150	1000	250	1,600,000
	Structural Sq. Edge & Sound	1100	1100	125	950	250	1,600,000
	No. 1 Common	800	800	100	800	200	1,600,000
Redwood	Super-Structural	1135	1138	93	1067	133	1,200,000
	Prime Structural	945	995	82	933	133	1,200,000
	Select Structural	758	880	70	825	133	1,200,000
	Heart Structural	644	768	56	750	133	1,200,000
Table IV-B Working Stresses for Structural Lumber and Timber Graded under the Structural Grade Examples of the American Lumber Standards							
Cedar, Alaska	Select Structural	800	900	90	646	150	1,200,000
	Common Structural	680	720	72	518	150	1,200,000
Cedar, Northern & Southern White	Select Structural	530	600	70	447	100	800,000
	Common Structural	450	480	56	358	100	800,000
Cedar, Port Orford	Select Structural	800	900	90	744	150	1,200,000
	Common Structural	680	720	72	597	150	1,200,000
Cedar, Western Red	Select Structural	670	750	80	645	125	1,000,000
	Common Structural	570	600	64	517	125	1,000,000
Cypress, Southern	Select Structural	800	900	100	793	225	1,200,000
	Common Structural	680	720	80	636	225	1,200,000
Douglas fir, Rocky Mountain Region	Select Structural	620	700	85	695	200	1,200,000
	Common Structural	530	560	68	558	200	1,200,000
Fir, Balsam	Select Structural	530	600	70	498	100	1,000,000
	Common Structural	450	480	56	399	100	1,000,000
Fir, Golden, Noble, Silver, White (Commercial White)	Select Structural	710	800	70	596	200	1,100,000
	Common Structural	600	640	56	478	200	1,100,000
Hemlock, Eastern	Select Structural	710	800	70	596	200	1,100,000
	Common Structural	600	640	56	478	200	1,100,000
Hemlock, West Coast	Select Structural	800	900	75	795	200	1,400,000
	Common Structural	680	729	60	637	200	1,400,000
Pine, California, Idaho & Northern White, Lodgepole, Ponderosa, Sugar	Select Structural	670	750	85	645	125	1,000,000
	Common Structural	570	600	68	517	125	1,000,000
Pine, Norway	Select Structural	710	800	85	695	150	1,200,000
	Common Structural	600	640	68	558	150	1,200,000
Spruce, Englemann	Select Structural	440	500	70	447	100	800,000
	Common Structural	370	400	56	358	100	800,000
Spruce, red, white, Sitka	Select Structural	710	800	85	646	125	1,200,000
	Common Structural	600	640	68	516	125	1,200,000
Tamarack, Eastern	Select Structural	800	900	95	794	200	1,300,000
	Common Structural	680	720	76	637	200	1,300,000

TABLE V - SAFE LOAD IN POUNDS PER SQUARE INCH OF CROSS-SECTIONAL AREA OF SQUARE
AND RECTANGULAR TIMBER COLUMNS (LOCATIONS OCCASIONALLY WET)

Safe Load in Pounds per square inch of cross sectional area of square and rectangular timber columns
used in Locations Occasionally Wet but Quickly Dried. This condition of use applies to exterior struc-
tures such as bridges, trestles, grandstands or bleachers and open sheds. For other conditions of use,
see Tables II and VI.

Species of Timber	Grade	* Ratio of Length to Least Dimension (L/d)										
		10 & less lbs.	L/d 12 lbs.	L/d 14 lbs.	L/d 16 lbs.	L/d 18 lbs.	L/d 20 lbs.	L/d 25 lbs.	L/d 30 lbs.	L/d 35 lbs.	L/d 40 lbs.	L/d 50 lbs.
Table V - A Allowable Column Loads for Manufacturers Association Standard Commercial Grades												
Douglas fir, Coast Region	Dense Super-Str.	1333	1295	1263	1214	1141	1041	702	487	358	274	175
	Super-Str. and	1200	1176	1152	1112	1059	986	702	487	358	274	175
	Dense Structural	1100	1079	1060	1032	992	937	702	487	358	274	175
	Com. Structural	1000	984	971	950	920	877	700	487	358	274	175
Douglas fir, Inland Empire	**Dense Super-Str.	1333	1295	1263	1214	1141	1041	702	487	358	274	175
	**Dense Structural	1200	1176	1152	1112	1059	986	702	487	358	274	175
	No. 1 Common Dimen- sion & Timbers	830	819	810	796	776	748	531	457	336	257	164
Larch, Western	No. 1 Common Dimen- sion & Timbers	830	816	805	786	759	723	568	396	291	263	142
Pine, Southern Yellow	Extra Dense Heart	1300	1265	1235	1190	1125	1027	701	487	359	274	175
	Dense heart	1150	1127	1104	1070	1024	966	701	437	358	274	175
	Str. Sq. Edge & Sound	1050	1029	1019	987	955	903	703	487	358	274	175
Redwood	No. 1 Common	900	888	878	862	842	810	675	487	358	274	175
	Super-Structural	1280	1221	1169	1094	979	822	526	365	268	206	132
	Prime Structural	1120	1080	1046	993	912	806	526	365	268	206	132
	Select Structural	990	963	939	903	851	778	526	365	268	206	132
	Heart Structural	900	879	861	843	796	739	526	365	268	206	132
Table V-B Allowable Column Loads for Structural Lumber and Timber Graded under the Structural Grade Examples of the American Lumber Standards												
Cedar, Alaska	Select Structural	744	738	728	712	689	657	523	365	268	206	132
	Common Structural	597	594	588	581	569	552	485	365	268	206	132
Cedar, Northern & Southern White	Select Structural	496	492	485	474	459	433	348	244	179	137	88
	Common Structural	398	396	392	387	379	368	323	244	179	137	88
Cedar, Port Orford	Select Structural	818	808	795	774	744	702	526	365	268	206	132
	Common Structural	656	652	645	634	613	597	506	365	268	206	132
Cedar, Western Red	Select Structural	693	686	674	656	629	592	438	304	224	171	110
	Common Structural	557	553	547	538	524	505	425	304	224	171	110
Cypress, Southern	Select Structural	986	972	947	910	856	781	526	365	268	206	132
	Common Structural	793	786	773	754	726	638	526	365	268	206	132
Douglas fir, Rocky Mt. Type	Select Structural	793	786	774	753	726	688	526	365	268	206	132
	Common Structural	636	632	627	617	602	582	500	365	268	206	132
Fir, Balsam	Select Structural	596	591	583	572	556	532	434	304	224	171	110
	Common Structural	478	476	472	466	457	445	395	304	224	171	110
Fir, Commercial White	Select Structural	694	689	678	664	641	611	482	335	246	188	121
	Common Structural	557	554	549	542	530	515	449	335	246	188	121
Hemlock, Eastern	Select Structural	694	689	678	664	641	611	482	335	246	188	121
	Common Structural	557	554	549	542	530	515	449	335	246	188	121
Hemlock, West Coast	Select Structural	893	885	872	852	823	793	614	426	313	240	153
	Common Structural	716	712	706	696	680	660	573	426	313	240	153
Pine, California, Idaho and northern white, Ponderosa & sugar	Select Structural	742	733	718	695	663	617	438	304	224	171	110
	Common Structural	596	591	583	572	556	532	434	304	224	171	110
Pine, Norway	Select Structural	793	786	774	753	726	688	526	365	268	206	132
	Common Structural	636	632	627	617	602	582	500	365	268	206	132
Spruce, Englemann	Select Structural	545	540	530	516	496	468	351	244	179	137	88
	Common Structural	437	435	430	423	412	398	338	244	179	137	88
Spruce, red, white and Sitka	Select Structural	744	738	728	712	689	657	523	365	268	206	132
	Common Structural	597	594	588	581	569	552	485	365	268	206	132
Tamarack	Select Structural	892	882	868	844	811	765	570	396	291	223	142
	Common Structural	716	711	703	691	674	650	548	396	291	223	142

* For columns with L/d intermediate between those which are given in this table, the safe load in pounds
per square inch may be determined by interpolation.

No column shall be used with greater unsupported length than 50 times its least diameter.

** When graded the same as corresponding grade of Coast Region Douglas Fir

TABLE VI - SAFE LOAD IN POUNDS PER SQUARE INCH OF CROSS-SECTIONAL AREA
OF SQUARE AND RECTANGULAR TIMBER COLUMNS (LOCATIONS USUALLY WET)

Safe Load in Pounds per square inch of cross sectional area of square and rectangular columns used in Locations Usually Wet. This condition of use applies where material is exposed to waves of tide water or in contact with earth or where it is more or less continuously damp or wet. For other conditions of use, see Tables II and V.

Species of Timber	Grade	* Ratio of Length to Least Dimension (L/d)											
		10 & less lbs.	L/d 12 lbs.	L/d 14 lbs.	L/d 16 lbs.	L/d 18 lbs.	L/d 20 lbs.	L/d 25 lbs.	L/d 30 lbs.	L/d 35 lbs.	L/d 40 lbs.	L/d 50 lbs.	
Table VI - A Allowable Column Loads for Manufacturers Association Standard Commercial Grades													
Douglas fir, Coast Region	Dense Super-Str.	1133	1110	1087	1059	1015	954	702	487	358	274	175	
	Super-Str. and Dense Structural	1000	984	971	950	920	877	700	487	358	274	175	
	Structural	933	920	909	891	867	833	689	487	358	274	175	
	Com. Structural	850	840	832	819	800	774	665	487	358	274	175	
Douglas fir, Inland Empire	**Dense Super-Str.	1133	1110	1087	1059	1015	954	702	487	358	274	175	
	**Dense Structural	1000	984	971	950	920	877	700	487	358	274	175	
	No. 1 Common Dimension & Timbers	655	651	645	638	628	615	561	453	336	257	164	
Larch, Western	No. 1 Common Dimension & Timbers	655	648	641	633	620	602	528	396	291	223	142	
Pine, Southern Yellow	Extra Dense Heart	1100	1078	1060	1034	990	935	701	487	358	274	175	
	Dense Heart	1000	984	970	950	920	880	700	487	358	274	175	
	Str. Sq. Edge & Sound	950	940	921	902	874	845	684	487	358	274	175	
	No. 1 Common	800	792	785	774	758	737	650	487	358	274	175	
Redwood	Super Structural	1067	1030	1002	958	893	804	526	365	268	206	132	
	Prime Structural	933	909	891	861	806	754	526	365	268	206	132	
	Select Structural	825	808	796	772	744	701	526	365	268	206	132	
	Heart Structural	750	738	727	711	687	657	520	365	268	206	132	
Table VI-B Allowable Column Loads for Structural Lumber and Timber Graded under the Structural Grade Examples of the American Lumber Standards													
Cedar, Alaska	Select Structural	646	642	636	625	611	590	504	365	268	206	132	
	Common Structural	518	516	513	507	500	489	444	364	268	206	132	
Cedar, Northern & Southern White	Select Structural	447	444	439	432	420	405	340	244	179	137	88	
	Common Structural	358	357	354	351	345	337	304	243	179	137	88	
Cedar, Port Orford	Select Structural	744	738	728	712	689	657	523	365	268	206	132	
	Common Structural	597	594	588	581	569	552	485	365	268	206	132	
Cedar, Western Red	Select Structural	645	639	629	614	593	564	439	304	224	171	110	
	Common Structural	517	514	510	502	491	476	412	304	224	171	110	
Cypress, Southern	Select Structural	793	786	774	753	726	688	526	365	268	206	132	
	Common Structural	636	632	627	617	602	582	500	365	268	206	132	
Douglas fir, Rocky Mt. Type	Select Structural	695	690	682	669	651	625	518	365	268	206	132	
	Common Structural	558	555	551	544	535	521	466	365	268	206	132	
Fir, Balsam	Select Structural	498	495	490	484	474	460	404	304	224	171	110	
	Common Structural	399	397	395	392	387	380	351	298	224	171	110	
Fir, Commercial White	Select Structural	596	593	587	577	563	544	463	335	246	188	121	
	Common Structural	478	476	473	468	461	451	409	334	246	188	121	
Hemlock, Eastern	Select Structural	596	593	587	577	563	544	463	335	246	188	121	
	Common Structural	478	476	473	468	461	451	409	334	246	188	121	
Hemlock, West Coast	Select Structural	795	790	780	766	746	718	598	426	313	240	153	
	Common Structural	637	634	630	623	612	598	537	426	313	240	153	
Pine, California, Idaho & Northern White, Ponderosa, & Sugar	Select Structural	645	639	629	614	593	564	439	304	224	171	110	
	Common Structural	517	514	510	502	491	476	412	304	224	171	110	
Pine, Norway	Select Structural	695	690	682	669	651	625	518	365	268	206	132	
	Common Structural	558	555	551	544	535	521	466	365	268	206	132	
Spruce, Engelmann	Select Structural	447	444	439	432	420	405	340	244	179	137	88	
	Common Structural	358	357	354	351	345	337	304	243	179	137	88	
Spruce, red, white & Sitka	Select Structural	646	642	636	625	611	590	504	365	268	206	132	
	Common Structural	518	516	513	507	500	489	444	364	268	206	132	
Tamarack	Select Structural	794	788	777	761	737	706	566	396	291	223	142	
	Common Structural	637	634	628	620	608	591	520	396	291	223	142	

* For columns with L/d intermediate between those which are given in this table, the safe load in pounds per square inch may be determined by interpolation.

No column shall be used with greater unsupported length than 50 times its least diameter.